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W. J. HARDEE. Capt.
CITY ENGINEER.
NEW ORLEANS, LA.

SPECIFICATIONS

THAT WILL GOVERN

THE CONSTRUCTION

—OF THE—

LIGHTING AND POWER SYSTEM

WHICH THE CITY OF

NEW ORLEANS, LOUISIANA,

PROPOSES TO CONSTRUCT.

COMPILED BY

CAPT. W. J. HARDEE, - - City Engineer
MR. FOSTER OLROYD, - - City Electrician
MR. ALFRED RAYMOND, Manager of Drainage

ADOPTED BY THE CITY COUNCIL
FEBRUARY 4, 1902.

New Orleans. Engineer Department

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NEW ORLEANS:
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BRIEF OUTLINE.

The system of lighting the public highways will be by means of electric arc lamps of the "Series Alternating Enclosed 475 watt Type," and the lighting of a limited number of public buildings with incandescent lights; in addition, the system will supply to a limited number of public buildings the energy required to operate pumps, fans and elevators.

For the present the number of lamps to light the public highways will be approximately 2,627 of which about 409 will be situated in the "UNDERGROUND DISTRICT" and served by conductors laid in three (3) inch, cast iron tubes, vitrified clay conduits, or ducts, and about 2,218 will be situated in the "OVERHEAD DISTRICT" and served by conductors strung overhead on wooden poles.

The "UNDERGROUND DISTRICT" is that part of the City of New Orleans included with the following limits: Starting at a point at the intersection of North Peters Street and Esplanade Avenue, thence along Esplanade Avenue to St. Claude Street; thence along St. Claude Street to St. Peter Street; thence along St. Peter Street to Basin Street; thence along Basin Street to Canal Street; thence along Elk Place to Tulane Avenue; thence along Saratoga Street to Howard Avenue; thence along Howard Avenue to Lee Circle; thence around the North Side of Lee Circle to Howard Avenue; thence along Howard Avenue to South Front Street; thence

along South Front Street to Poydras Street; thence along Delta Street to Customhouse Street, thence along Customhouse Street to North Peters Street; thence along North Peters Street to the point of commencement at North Peters Street and Esplanade Avenue. Canal Street, full width, from Basin Street to Metairie Road.

The "OVERHEAD DISTRICT" is all that part of the City of New Orleans not included in the Underground District. The energy necessary to operate the incandescent lights, pumps, fans, and elevators will, for the present, be equal to approximately 150,000 kilo-watt hours service per annum.

The City of New Orleans will furnish the ground upon which to erect the Generating Station. The Station will include a Power House, Office and Stable Building, a Store-shed, and Yards.

The Generating Station shall be located on the premises now occupied by the Police Jail and Work-house, situated between Cypress and Perrilliat Streets on two sides, and the Girod Street Cemetery and the Sam'l. J. Peters School on the other two sides.

"The Contractor will cut down, to the height of the existing cemetery fence on Perrilliat Street, the brick fence along the cemetery side of the premises; he will cut down, to within twelve (12) feet of the sidewalk grade, the brick fence on Perrilliat and on Cypress Streets from the lake side of the newly opened South Robertson Street to the Sam'l. J. Peters School side of the premises; he will cut down, to within about ten (10) feet of the yard grade, the brick fence along the Sam'l. J. Peters School side of the premises. He will entirely remove

such other parts of the brick fence as will not be cut down, and he will entirely remove the office building. Brick removed from the fences and building that are of suitable character may be used in constructing the Lighting and Power System."

South Robertson Street will be opened and graded through the above described property, from Perrilliat Street to Cypress Street. The sidewalks on the newly opened South Robertson Street together with the sidewalks abreast of the Generating Station on both Cypress and Perrilliat Streets, will be raised to established grade. The sidewalks will be lined with stone curb throughout; such existing curb stones, as are of suitable dimensions and of satisfactory quality will be reset to proper line and grade.

A four (4) inch cast iron water main will be laid from the four (4) inch existing water main on Perrilliat Street so as to form a complete loop around the Main Yard to serve the standard double outlet fire hydrants, one of which will be placed near each corner of the Power House; a branch will be laid from the loop to the Office and Stable Building; a second branch will be laid to the pumps in the Power House with a stop valve nearby the pumps. A branch will be laid from the existing main on Perrilliat Street to the water trough in the Store Yard.

A thirty (30) inch cast iron supply pipe and thirty (30) inch cast iron discharge pipe will be laid beneath the surface of the street from the New Basin Canal through South Robertson Street to Cypress Street, thence through Cypress Street to a point abreast of the Power House, and thence into the Power House to furnish water for condensing purposes.

Artesian wells will be driven to furnish water for boiler purposes.

Sub-surface drain pipes will be laid to dispose of the surface drainage of the Main Yard and the drainage of the buildings by conducting the run-off to the nearest street gutter.

The top of the concrete foundation will be equal to about the present highest point of the ground. All earth resulting from foundation excavations and oil tank pit excavations, in excess of that required to grade South Robertson Street, sidewalks and yards, will be removed from the premises at the expense of the contractor.

Five (5) feet in width of the sidewalks abreast of the Generating Station, together with certain foot-walks throughout the grounds will be paved with artifical stone pavement; wagon passages will be paved with vitrified brick.

That part of the Generating Station grounds, on the North Side of the newly opened South Roberton Street, will be graded and enclosed with a feather edge board fence. In the enclosure there will be built an ordinary frame shed with slate roof for storage purposes; a metal water trough will also be erected.

A single line rail-road track will be laid in South Robertson Street to Cypress Street form the main line track of the Yazoo & Mississippi Valley Railroad on Poydras Street.

A Block Plan, including profiles and cross-sections, on file in the Office of the City Engineer, shows the location of the several features above referred to, as well as the approximate amount of grading, artificial stone pavement and vitrified brick pavement.

The POWER HOUSE will measure one hundred and thirty-eight (138) feet long by one hundred and thirteen and one-half (113½) feet wide and face on Cypress Street. It will be erected on pile and concrete foundation. A number of additional piles will be driven to provide for future extension of the building. The walls will be made of ordinary brick masonry, and measure sixty-five (65) feet high from the grade of the building to its top; the cornice at top will also be formed of brick masonry. The walls will be faced on the outside with pressed brick, of such colors as may be designated, in order to effect a contrast between the wall surfaces and the trimmings about the openings. On the front of the building, in addition to the vari-colored pressed brick, terra cotta trimmings will be employed to further ornament the openings.

Except throughout the basement floor, in the engine room for a height of about twelve (12) feet above the floor, and in the lower and upper lavatory, the walls in the interior of the two sections of the building will be faced with pressed brick, for a height of about twelve (12) feet above the floor, with enamel brick. The walls and ceilings of the upper and lower lavatory will be faced with standard wall tiles.

The frame of the building, and the roof and floor frames, will be formed of structural steel and iron members.

The roof will be covered with first grade book roof tiles.

On the roof of each of the two sections of the building, and for nearly their entire length, a skylight will be placed, fitted with louvres and covered with stationary frosted and ribbed glass.

All doors and the frames of all openings, except door and

window sills, which will be of white marble, will be made of first grade cypress lumber finished in hard oil.

All glazing, except in the skylights, will be American "A" grade double thick glass, and large lights. The sash in the semi-circular windows will be stationary; those in the other windows will be made to raise and lower with cords and weights.

Five (5) brick masonry engine piers, extending from the concrete foundation to the top of the engine room floor, will be constructed; space will be provided for a sixth engine pier, but it will not, for the present, be built.

The basement floor will be formed by an addition of cement mortar laid on the top of the concrete foundation, so sloped that the drainage of the floor will be concentrated at several points and thence conducted by sub-surface tile drain pipes to the street gutters.

A secondary floor composed of five-sixteenths (5-16) inch steel plates resting on "I" beams will be built three (3) feet above the basement floor in both sections of the building, except the area covered by the lower lavatory, in order to provide space for the accommodation of all pipes other than steam pipes.

The engine room floor will be formed of "I" beams with brick masonry arches between, and brought to true surface with concrete, upon which, surface floor tiles will be laid in a bed of mortar.

Iron stairways will connect the basement and engine room floors with the switch board and lavatory floors.

An ornamental iron stairway will be placed on the outside

of the building, at its front, to furnish access to the engine room floor from the yard foot-walks.

The main doors connecting the boiler room with the yard will be fitted with rolling steel blinds.

For the length of the boiler room, a shed will be constructed on the outside of the building, formed of a steel frame, supported on ornamental metal brackets and covered with book roof tiles.

In the two lavatories there will be placed stationary wash-stands, shower baths, urinals and flush tank closets, vented and otherwise arranged according to the most approved sanitary plumbing methods.

The waste from the wash stands and shower baths will be discharged into the street gutters by means of sub-surface tile drain pipes. The waste from the urinals and closets will be discharged into a cesspool constructed for that purpose in the yard on the outside of the building.

Metal wicker lockers fitted with shelves, clothes hooks and door with lock and key, will be placed in the lavatories.

The following steam and electrical machinery will be installed in the Power House:

Three batteries of two boilers each; each battery will have about 750 commercial h. p. capacity. The boilrs will be of the Horizontal Water Tube Type. Economizers will be used in connection with the boilers for the purpose of feed water heating. Oil will be used for fuel; furnaces will be arranged accordingly. Artificial draft will be employed if necessary. One chimney will be erected to which all furnaces will be connected.

Pumps, which supply boilers with feed water, will be con-

nected to the artesian well and the yard waterworks system, the said pumps and boilers to be connected by a duplicate set of pipes.

Four Independent Vertical Compound Condensing Engines of about 750 indicated h. p. capacity each, three of which will develop sufficient energy to operate all the public highway lights; the fourth unit is a reserve to meet contingencies in the event of a break down.

Four Generators of about 500 kilo-watts capacity each.

One Independent Vertical Compound Condensing Engine of about 300 indicated h. p. capacity to furnish energy during day time for the operation of the pumps, elevators and fans, and the incandescent lighting service.

One Generator of about 200 kilo-watts capacity.

The engines and generators will be direct coupled.

Three jet condensers of about 1,500 h. p. capacity each.

Condensers will be so arranged and piped that any one of them may be connected with any one engine or number of engines. Water supply for condensers will be from the New Basin Canal through the thirty (30) inch main, already described. The discharge will be returned by gravity to the New Basin Canal.

A complete equipment of steam exhaust and water pipes, including a fire hydrant service in the interior of the building connected with pumps to provide high pressure.

About fifty-five (55) Constant Current Transformers of about fifty (50) lights capacity each.

A completely equipped panel switch-board, including indicating and recording instruments of the most improved type.

A machine and black smith shop with complement of tools, drill press, lathes, forge, etc., electrically driven.

The Station will be equipped with a portable boiler and pump of three h. p. capacity for service in pumping manholes.

THE OFFICE AND STABLE BUILDING will measure one hundred and thirteen and one-half (113½) feet by twenty-seven (27) feet two (2) inches wide, with the rear resting on and extending along the property line of Perrilliat Street.

The building will be two stories high with gable roof. The lower story will be eighteen (18) feet high, and the upper story fifteen (15) feet high.

The walls will be made or ordinary brick masonry resting on brick masonry footings and a cypress board grillage. The walls will be faced on the outside with pressed brick, of such colors as may be designated, in order to effect a contrast between the wall surfaces and the trimmings about the openings.

The floor, roof and partition frames will be made of pine lumber; the roof will be covered with slate.

All doors and the frames of all openings, except door and window sills which will be white polished marble, will be made of first quality cypress, and finished in hard oil on the interior of the building.

The brick walls on the interior of the lower floor will be white washed. Windows will be glazed with American "A" grade glass.

The lower floor, stalls excepted, will be paved with vitrified brick.

The lower floor will contain a store-room for heavy articles,

fitted with a hand hoist and storage platforms; a stable embracing twelve (12) stalls with wooden floor, metal feed boxes and hay racks, wooden partitions covered with metal, and iron grated ventilating windows; and, a feed and harness room.

The upper floor will be divided by plastered partitions so as to form a long hall, an office room, a testing room, a repair room, and a store-room for light articles. A well hole in the repair room fitted with a hand hoist will connect the upper and lower floors.

A light iron stairway with landing at top will be placed on the outside of each end of the building to furnish access to the upper floor from the yard.

The hall and each room on the upper floor will be heated by steam supplied from the Power House.

The upper floor and the feed room on the lower floor will be wired for and equipped with incandescent lamps. Two high candle power arc lamps will be installed in the stable and one in the store-room on the ground floor.

A large metal water trough will be placed alongside the building in the yard between the two main stable doors.

The Generating Station will be equipped with fire and garden hose, lawn mowers, together with a complement of furniture for the office, testing, repair and store-rooms, and a full set of testing instruments. Also twelve (12) first grade draft horses, two (2) double horse covered express wagons of not less than five thousand (5,000) pounds capacity each, two (2) single horse covered single wagons, four (4) single horse spring jumpers, one (1) first grade four wheel covered spring buggy, one (1) long coupled log wagon, two (2) sets

of double express, and seven (7) sets of single express, first grade harness, and one (1) set four horse heavy harness for log wagon team.

There will be constructed under the yard and abreast of the boiler room four (4) tanks for the storage of oil; the tanks will each measure fifty (50) feet in length, eight (8) feet in diameter, and their combined capacity will be equal to about twelve (12) days' fuel supply for the Power House. They will be made of steel sheets three-sixteenths (3-16) inch in thickness closely riveted; the end plates of each tank will be stiffened with the necessary number of gusset plates, angle irons, etc. Each tank will be equipped with a manhole and tight fitting cover. The tanks will rest upon wooden saddles. Each tank will be fitted with a self-recording gage, and vented according to the most approved practice. The tanks will be fitted with a complement of supply pipes and discharge pipes, including all necessary valves, cut-offs, etc.

The tanks will be placed in a masonry vault measuring one hundred and thirteen (113) feet long from outside of end wall to outside of end wall, twenty-five feet (25) feet wide from outside of side wall to outside of side wall, and fourteen (14) feet two (2) inches in height from base of concrete foundation to top of manholes. The foundation of the vault will be built of concrete twenty-four (24) inches in thickness; the walls will be built of brick masonry. The surface of the concrete foundation will be finished in cement mortar sloped from the sides and ends to a pool at the centre so that the drainage of the pit will be concentrated at that point.

The roof of the vault will be formed of transverse "I" beams resting at their outer ends on the masonry walls, and

at their inner ends on an "I" beam supported by a longitudinal line of metal columns. The space between the transverse "I" beams will be arched with brick masonry and brought to true surface with concrete.

At the four (4) corners of the vault and on each side, at a point midway its length, manholes will be constructed with tight-fitting covers. At three manholes, iron ladders spanning from top to bottom of vault, will be erected.

The service will embrace fifty-three (53) arc circuits with about fifty (50) lamps to each circuit, and two (2) incandescen circuits.

There will be constructed in Cypress Street, immediately in front of the Power House, a large masonry manhole covered with "I" beams, masonry arches, and fitted with a tight-fitting metal cover. From this manhole to the Power House a brick masonry tunnel measuring about six (6) feet wide by about seven (7) feet high will be built. In this tunnel will be placed the conductors forming the several circuits.

To obviate destruction or interference by fire the conductors will be laid in a conduit under Cypress Street to the intersection of that street and South Claiborne Street. The conductors forming the circuits which will extend South of Cypress Street will be laid in a conduit under South Claiborne Street to the New Basin Canal, and South of that Canal to the point at which they will change from underground to overhead.

A heavy pole trunk line will be located on the Neutral Ground of Claiborne Street to carry the conductors overhead forming the circuits which extend both North and South of Cypress Street.

The New Basin Canal, the Old Basin Canal, and the Mississippi River will be crossed with submarine cables. Reserve cables will be laid across the two (2) canals.

The trunk line on the North Side of Cypress Street will follow North Claiborne to Elysian Fields Avenue, thence to St. Claude, thence to Poland Street, thence to Dauphine Street, thence to lower limits of the city.

The trunk line on the South Side of Cypress Street will follow South Claiborne Street to Louisiana Avenue, thence to Magnolia Street, thence to the upper side of the Tulane University Grounds, and thence through Oak Street to the upper limits of the city.

The greater length of the trunk line will be placed on North Claiborne Street and South Claiborne Street because that location represents the shortest route by which the areas included in the several circuits can be reached, and because the width of the street assures practical immunity against destruction of conductors or interference by fire. A map on file in the Office of the City Engineer shows the location of all lights as well as the route through the streets of all circuits.

Lamps in the Underground District will be suspended from ornamental combination wood and iron posts of the "Goose Neck Type;" the conductors will be laid in cast iron tubes, or in vitrified clay conduits, or ducts.

In the Underground District it is proposed in the general case in Parks and Squares, and on streets paved with either asphalt, vitrified brick, or Belgium Block, to lay the conductors in cast iron tubes placed immediately under the sub-grade of the sidewalks; where such construction is employed cast iron

subsidiary manholes, with tight fitting double iron covers, will be used in lieu of masonry manholes.

On the unpaved streets, or streets paved with inferior pavements in the Underground District, the conductors will be laid in vitrified clay conduits, or ducts, placed in shallow trenches; where such construction is employed masonry manholes with a tight fitting iron cover will be used.

In the Underground District additional tubes or ducts will be laid to provide service for the Police and Telegraph wires, and for the Fire Alarm wires. No cables, however, for those services will be furnished. There will also be laid in St. Louis Street from North Rampart Street to the River four additional ducts to carry the conductors for the Algiers service.

Cable boxes will be provided at points where the conductors change from overhead to underground.

In the Overhead District conductors will be strung on sawed and dressed, neatly chamfered, wooden poles.

On the following streets, and in the parks and squares outside of the Underground District, the lamps will be suspended from a neat metal bracket attached to a sawed and dressed, neatly chamfered, wooden pole; St. Charles Avenue, from Howard Avenue to Carrollton Avenue; Rampart Street, from Tulane Avenue to Esplanade Avenue; Claiborne Avenue, from Tulane Avenue to Elysian Fields Avenue; Esplanade Avenue from North Peters Street to Galvez Street.

All other lamps in the Overhead District will be suspended from a neat metal crane attached to a sawed and dressed neatly chamfered, wooden pole.

All lamp posts and poles will be neatly painted, and have inscribed upon them the number of the circuit to which they belong, and the post or post number. That length of the wooden poles which extends beneath the ground will be creosoted. Such posts and poles, as may be designated, will rest upon and be embedded in concrete.

The conductors in the Underground District will be rubber and lead covered.

Those in the Overhead District shall be of the kind known as having triple-braid, weather-proof insulation.

The lamps will be of the most improved type; they will be fitted with carbons partly enclosed by and consumed within a close-fitting small inner glass globe and a large outer glass globe; the globes will be either clear or opalescent, as may be designated. Lamps will be fitted with metal reflectors.

Lamps will be hung so that the arc of the lamp will be from twelve (12) feet to eighteen (18) feet above the surface of the street, as may be directed by the City Engineer and City Electrician.

The incandescent service that will be installed will include, in addition to the conduits and conductors for the transmission of the necessary energy, the re-wiring of the City Hall, the Court House and Jail Building, and the several Court Buildings in the vicinity of Jackson Square.

PROPOSAL.

New Orleans, La....., 1902.

TO THE MAYOR AND CITY COUNCIL OF NEW ORLEANS, LA.

GENTLEMEN:

I (or) We propose to furnish all necessary materials and labor and construct for the City of New Orleans, La., in accordance with the specifications hereto attached and hereby made a part of this proposal, an Electric Light and Power System, at the following prices for the several parts of the said system:

(NOTE: Section numbers in the proposal refer to the number of the Section in the Specifications in which the item is described and how it will be paid for.)

CURB: (Section 32.)

430 Lineal feet Old Curb relined and reset,

.....Dollars.....Cents ($) per lin. ft.

1260 Superficial feet New Curb,

.....Dollars.....Cents ($) per sup. ft.

YARD DRAINS: (Section 33.)

400 Lineal feet six (6) inch tiles,

.....Dollars.....Cents ($) per lin. ft.

BRICK MASONRY:

16,000 Cubic Feet, CATCH BASINS (Sec. 33.)

TUNNEL (Sec. 163) AND MANHOLES.
(Sec. 160.)

.....Dollars.....Cents ($) per cub. ft.

CESSPOOL: (Section 34.)

.....Dollars.....Cents ($)

WATER MAINS: (Section 35.)

740 Lineal feet of water mains,

.....Dollars.....Cents ($)per lin. ft.

FIRE HYDRANTS: (Section 36.)

4 Hydrants

.....Dollars.....Cents ($) p. hydrant.

RISERS: (Section 37.)

4 Risers,

.....Dollars.....Cents ($) per riser.

WATER TROUGHS: (Section 38.)

2 Troughs.

.....Dollars.....Cents ($ per trough.

PAVEMENTS: (Sections 39 and 40.)

850 Square Yards Artificial Stone,

.....Dollars.....Cents ($) per sq. yd.

640 Square Yards Vitrified Brick,

.....Dollars.....Cents ($) per sq. yd.

IRON CASTINGS:

350,000 Pounds, CATCH BASINS (Sec. 33.)

BRIDGES (Sec. 41), MANHOLES (Sec. 161.)

.....Dollars.....Cents ($) per pound

FRAME SHED: (Section 42.)

.....Dollars.....Cents ($)

FEATHER EDGE BOARD FENCE: (Section 43)

....Dollars.....Cents ($)

SWITCH TRACK: (Section 44.)

.....Dollars.....Cents ($)

EQUIPMENT FOR GROUNDS: (Section 45.)

.....Dollars.....Cents ($)

PILES: (Section 53.)
54,000 Lineal feet,

....Dollars.....Cents ($ per lin. ft.)

EXCAVATIONS:

2640 Cubic Yards POWER HOUSE FOUNDATION (Sec. 54.)

.....Dollars.....Cents ($) per cub. yd.

240 Cubic Yards, OFFICE AND STABLE BUILDING (Section 118.)

.....Dollars.....Cents ($) per cub. yd.

2130 Cubic Yards. OIL TANKS (Sec. 150.)

.....Dollars.....Cents ($) per cub. yd.

30,000 Cubic Yards, PIPE LINE (Sec. 94.)

TUNNEL (Sec. 163), MANHOLES AND CONDUITS (Sec. 160.)

.....Dollars.....Cents ($) per cub. yd.

CONCRETE:

2455 Cubic Yards, Power House (Sec. 55), AND OIL TANKS (Sec. 151.)

.....Dollars.....Cents ($) per cub. yd.

390 Cubic Yards, TUNNEL (Sec. 163), MANHOLES (Sec. 161) AND OTHER STREET WORK,

.....Dollars.....Cents ($) per cub. yd.

POWER HOUSE.

BUILDING (Complete, Sections 55, Paragraph "b" to 84, inclusive.)

.....Dollars.....Cents ($)

EQUIPMENT.

EQUIPMENT (complete, Sections 86 to 116, inclusive.)

.....Dollars.....Cents ($)

SUB-GRADE LUMBER:

58,000 Feet B. M. sub-grade lumber TUNNEL (Sec. 163), AND MANHOLES (Sec. 161.)

.....Dollars.....Cents ($) per B. M.

SUBSIDIARY MANHOLES: (Section 162.)

43 Class "A."

.....Dollars.....Cents ($ per manhole.

156 Class "B."

.....Dollars.....Cents ($ per manhole.

TUNNEL: (Section 163.)

LAMPS AND BRACKETS:

.....Dollars.....Cents ($)

2,200 Pounds "I" Beams,

.....Dollars.....Cents ($) per pound.

CONDUITS: (Section 164.)

83,000 Lineal Feet, Class "A,"

.....Dollars.....Cents ($) per lin. ft.

409 Elbows,

.....Dollars.....Cents ($) per elbow

CLASS "B,"

61,000 Lineal Feet No. 1,

.....Dollars.....Cents ($) per lin. ft.

3,000 Lineal Feet No. 2,

.....Dollars.....Cents ($) per lin. ft.

4,500 Lineal Feet, No. 3,

.....Dollars.....Cents ($) per lin. ft.

260 Lineal Feet, No. 4,

.....Dollars.....Cents ($) per lin. ft.

160 Lineal Feet, No. 5,

.....Dollars.....Cents ($) per lin. ft.

370 Lineal Feet, No. 6,

.....Dollars.....Cents ($) per lin. ft.

1,320 Lineal Feet, No. 7

.....Dollars.....Cents ($) per lin. ft.

LAMP POSTS: (Section 165.)

CLASS "B."

409 Posts,

.....Dollars.....Cents ($) per post.

LAMP POLES: (Section 165.)

CLASS "B."

210, No 1

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

10, No. 2

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

76, No. 3

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

5, No. 4

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

10, No. 5

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

CLASS "C."

1640, No. 1

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

31, No. 2

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

210, No. 3

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

16, No. 4

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

10, No. 5

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

CIRCUIT POLES: (Section 166.)

6175, No. 1

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

15, No. 2

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

800, No. 3

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

5, No. 4

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

5, No. 5

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

CROSS-ARMS: (Sections 167 and 172.)

10,410, No. 1

.....Dollars.....Cents ($) per cross-arm

210, No. 2

.....Dollars.....Cents ($) per cross-arm

930, No. 3

.....Dollars.....Cents ($) per cross-arm

CROSS-ARM PINS: (Sections 168 and 173.)

22,700 pins.....Dollars.....Cents ($) per 100 pins

INSULATORS: (Sections 169 and 174.)

22,700 insulators

.....Dollars....Cents ($) per 100 insulators

LAMP AND CIRCUIT POLE GUYS: (Section 170.)

1425 Guys

Cypress.....Dollars.....Cents ($) per guy.

Pine.....Dollars.....Cents ($) per guy.

TRUNK LINE POLES: (Section 171.)

120, No. 1

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

12, No. 2

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

28, No. 3

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

10, No. 4

Cypress.....Dollars.....Cents ($) per pole.

Pine.....Dollars.....Cents ($) per pole.

TRUNK LINE GUYS: (Section 175.)

75 Guys

Cypress.....Dollars.....Cents ($) per guy.

Pine.....Dollars.....Cents ($) per guy.

CABLE BOXES: (Section 176.)

8 Boxes.....Dollars.....Cents ($) per box

RELAYING PAVEMENTS: (Section 177.)

700 Square Yards of Asphalt,

.....Dollars.....Cents ($) per sq. yd.

100 Square Yards Belgian Block,

.....Dollars.....Cents ($) per sq. yd.

50 Square Yards Vitrified Brick,

.....Dollars.....Cents ($) per sq. yd.

2,000 Square Yards Square Block,

.....Dollars.....Cents ($) per sq. yd.

500 Square Yards Cobblestone,

.....Dollars.....Cents ($) per sq. yd.

4,000 Square Yards Artificial Stone,

.....Dollars.....Cents ($) per sq. yd.

5,000 Square Yards Flagstone,

.....Dollars.....Cents ($) per sq. yd.

13,600 Square Yards Brick,

.....Dollars.....Cents ($) per sq. yd.

40 Square Yards Gravel,

.....Dollars.....Cents ($) per sq. yd.

CONDUCTORS: (Section 178.)

2,200,000 Lineal Feet, Class "A,"

.....Dollars.....Cents ($) per lin. ft.

255,000 Lineal Feet, Class "B,"

.....Dollars.....Cents ($) per lin. ft.

6,500 Lineal Feet, Class "C,"

.....Dollars.....Cents ($) per lin. ft.

1,500 Lineal Feet, Class "D."

.....Dollars.....Cents ($) per lin. ft.

1,500 Lineal Feet, Class "D,"

.....Dollars.....Cents ($) per lin. ft.

2,200 Lineal Feet, Class "E,"

.....Dollars.....Cents ($) per lin. ft.

4,300 Lineal Feet, Class "F,"

.....Dollars.....Cents ($) per lin. ft.

165,000 Lineal Feet, Class "G,"

.....Dollars.....Cents ($) per lin. ft.

40,000 Lineal Feet, Class "H,"

.....Dollars.....Cents ($) per lin. ft.

10,000 Lineal Feet, Class "I,"

.....Dollars.....Cents ($) per lin. ft.

LAMPS: (Section 179.)

2627 Lamps.....Dollars.....Cents ($) per lamp

LIGHTING—INCANDESCENT SERVICE: (Section 182.)

.....Dollars.....Cents ($)

Signature.....

Address.....

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GENERAL SPECIFICATIONS.

1. BLANK FORMS: The City Engineer will furnish bidders with a blank form of proposal; no proposal will be considered unless submitted on such form.

2. BIDDERS: (a) Bidders must fill out their bids both in writing and in figures and give their names and addresses in full.

(b) Bidders are cautioned not to attach any conditions other than those called for in the specifications to their bids; uncalled for conditions will render the bid informal and cause its rejection.

(c) When a firm or corporation is a bidder, the member of the firm, or agent who signs the firm's name to the proposal, shall state, in addition, the names of all the individuals composing the firm, or officers of the corporation.

(d) Any one signing the proposal as the agent of another or others must file with it legal evidence of his authority to do so.

(e) Any bid which fails to name a price, both in writing and in figures, will be deemed informal and it will be rejected; in case of any discrepancy between the price written in the bid and that given in figures, the price in writing will be considered as the bid.

3. GUARANTY: (a) Each bidder must enclose with his proposal a receipt from the City Treasurer for the sum of Ten Thousand Dollars ($10,000.00), as a guarantee that he will, if awarded the work according to the terms of his proposal, enter into contract within forty-eight (48) hours after notice from the City Notary that the instrument is ready for signature.

(b) As soon as the contract has been finally awarded according to law, guaranty deposits will be returned to all bidders other than the successful bidder, and the guaranty deposit of the successful bidder will be returned on the signing of the contract.

(c) Should the bidder to whom the contract is awarded fail to enter into contract within the allotted time, the amount of guaranty deposited by him will, ipso facto, be forfeited to the City of New Orleans, not as a penalty, but as acknowledged liquidated damages.

4. METHOD OF LIGHTING: The lighting system shall be the "Series Alternating Enclosed Type;" the style and power of lamps is hereinafter described.

5. TERRITORY: (a) The territory to be lighted under these specifications will be that indicated by the locations of lamps designated by colored discs on a map of the City of New Orleans approved by the City Council, and on file in the Office of the City Engineer, which map is hereby referred to and made a part of these specifications, but not attached thereto because of its size rendering attachment impracticable.

The locations of lamps, as indicated on the map referred to, are approximate only and subject to such changes as the City Engineer and City Electrician may deem advisable.

(b) The territory to be lighted shall be divided into two districts, one of which is hereby designated the "UNDERGROUND DISTRICT," and the other the "OVERHEAD DISTRICT."

(c) The locations of lamps in the Underground District are indicated on the map by a purple disc.

All lamps in the Underground District, except those which will be installed in public buildings, shall be suspended from a neat combination wood and iron post, as hereinafter described.

All conductors in the Underground District shall be placed in iron tubes, or vitrified clay conduits, or ducts as hereinafter described.

(d) The locations of all lamps in the Overhead District are indicated on the map by red and green colored discs.

All conductors in the Overhead District will be strung overhead on sawed and dressed wooden poles, as hereinafter described.

All lamps in the Overhead District indicated on the map by a red colored disc shall be suspended from a neat metal crane attached to a sawed and dressed wooden pole, as hereinafter described.

(e) The lamps on the principal avenues and streets of the city, as well as those in the public parks and squares, outside of the Underground District, though served from overhead wires, will be suspended from a metal bracket attached to a sawed and dressed wooden pole, as hereinafter described. Those lamps are indicated on the map referred to by a green disc.

(f) The character, location and dimensions of the conduits,

ducts or tubes, and the manholes and subsidiary manholes incidentally necessary thereto, shall be designated by the City Engineer and City Electrician.

6. PUBLIC BUILDINGS: (a) The Lighting and Power System provided for under these specifications shall include the supply of such electrical energy as may be necessary to operate pumps, elevators, fans and incandescent lights in the several Court Buildings in the vicinity of Jackson Square, the City Hall, the Court House and Jail Building, and the House of Detention.

(b) The interior wiring of the buildings named in the preceding paragraph, the House of Detention excepted, shall be entirely renewed, either concealed or open work, according to the present method of wiring.

(c) The service and wiring of the buildings referred to in the preceding paragraphs, shall be as hereinafter described.

7. LOCATION AND PLANS: (a) The City Engineer will furnish, without cost to the contractor, the necessary space upon which to erect the Generating Station, Out-Buildings, Yards, etc.; the said space will be the premises now occupied by the Police Jail and Workhouse, bounded by Perrilliat and Cypress Streets on two sides, and the Sam'l J. Peters School and the Girod Street Cemetery on the other two sides.

(b) The City Engineer will furnish general or main feature plans, approved by the City Council, which will govern the construction of the several parts of the system. Detail plans governing the construction of individual parts of the sys-

tem will be furnished, from time to time, as required during the progress of the work.

(c) All work designated on the plans or described in these specifications must be executed, whether designated on, or described in, one only or both; the contractor shall furnish all materials and do such other work as may not be expressly set forth on either the plans or in the specifications but which may be deemed necessary by the City Engineer and City Electrician to fully and properly complete the Lighting and Power System, in a manner conformable with the character and style indicated by the plans and specifications, and in accordance with the most modern and approved practice.

(d) Where dimensions are expressed in figures on the plans, they will be used, otherwise, they will be scaled.

(e) Bidders are cautioned to personally examine the plans in the Office of the City Engineer, and the location of the proposed Lighting and Power System, as well as everything appertaining thereto, in order that no misunderstanding may afterwards arise as to the character or as to the amount of the work to be done. No additional compensation will be granted because of any unusual difficulties which may be encountered in constructing any part of the system, or because of any misunderstanding by the bidder to whom the contract may have been awarded as to what will be required.

8. QUANTITIES: (a) The quantity of each item contemplated as necessary to fully and entirely construct and complete the Lighting and Power System is included in the proposal; such quantities, though determined in advance with as much

accuracy as possible, are approximate only and the City of New Orleans shall be privileged, as it may elect, to either increase or decrease, to a reasonable extent, any and all quantities.

(b) The quantity of each item contemplated as necessary to fully and entirely construct and complete the Lighting and Power System is included in the proposal; such quantities, though determined in advance with as much accuracy as possible, are approximate only and the City of New Orleans shall be privileged, as it may elect, to either increase or decrease, to a reasonable extent, any and all quantities.

(c) Should any work for which a quantity is not included in the proposal, be deemed necessary, such work will be executed as an EXTRA as provided in Section 9, of these specifications.

9. EXTRA WORK: The contractor must be prepared to do any extra work that may be ordered, in writing, by the City Engineer and City Electrician. For such work he will be paid the actual cost of materials and labor employed, plus an allowance of fifteen (15) per cent. on the total thereof for supervision and use of tools. No allowance will be made for extra work unless the same has been ordered, in writing, by the City Engineer and City Electrician, and a bill in duplicate therefor is submitted to and approved by the City Engineer and City Electrician.

10. PROPOSAL: Proposal must be enclosed in an envelope and endorsed: "Proposal for constructing a Lighting and Power System," and addressed to the Comptroller of the City of New Orleans.

11. PRICES: (a) Prices must include the furnishing of all materials, labor and tools necessary to construct the parts of the Lighting and Power System covered by the bid in full conformity with these specifications, either expressed or implied.

(b) Unit prices will be bid for those items the quantity of which may vary depending on conditions found in constructing the system; for those items, the extent of which is definitely known in advance, a lump sum price will be bid.

(c) Bidders will propose a price for both cypress and pine lamp poles, circuit poles, lamp and circuit pole guys, trunk line poles and trunk line guys. The City of New Orleans reserve the right to use either cypress or pine poles and guys as it may elect.

(d) That work for which no price is included in the proposal will be executed as EXTRA WORK, and will be paid for as prescribed in Section 9, of these specifications.

12. REJECTION OF PROPOSALS: (a) The Mayor and City Council reserve the right to reject any and all proposals.

(b) Reasonable grounds for supposing that any bidder is interested in more than one proposal will cause the rejection of all proposals in which he is deemed to be interested.

13. BOND: (a) The successful bidder shall furnish a bond with a Surety Company acceptable to the Mayor and to the City Council of New Orleans in an amount of One Hundred Thousand Dollars ($100,000.00), as surety for the faithful performance of the contract and these specifications in all their detail in so far as they relate to and govern the construction of all parts of the Lighting and Power System.

(b) Upon the completion of the Lighting and Power System, and before its acceptance by the City of New Orleans, the contractor shall furnish a guarantee or maintenance bond with a Surety Company acceptable to the Mayor and to the City Council of New Orleans, in an amount of Twenty-five Thousand Dollars ($25,000.00) as surety for the faithful discharge of the obligations prescribed in Section 116, of these specifications.

(c) Contract and bond shall be executed before the City Notary at the expense of the adjudicatee.

14. TRANSFER: The Contract shall not be transferred without the consent of the City Council expressed by ordinance.

15. PROSECUTION OF WORK: (a) The contractor shall file with the City Engineer a certified copy of the contract before he will be allowed to commence any portion of the work.

(b) Construction shall be commenced within ten (10) days after receipt of written notice from the City Engineer and City Electrician, and prosecuted as they may direct; the entire Lighting and Power System shall be completed within fifteen (15) months after commencement.

(c) The date of completion of the system, however, will be extended to compensate for all delays occasioned by any act of omission or commission on the part of the city, all of which will be determined by the City Engineer and City Electrician, who will certify to the same in writing, including such time as the completion of the system may have been suspended by the written order of the City Engineer and City Electrician. But

neither the extension of time for any reason beyond the date herein affixed for the completion of the system will be deemed a waiver by the city of the right to abrogate the contract for abandonment or delay.

(d) Should the city abrogate the contract for abandonment by the contractor for failure to comply with these specifications, such abrogation shall carry with it forfeiture of the full amount of the bond described in section 13, of these specifications; the forfeiture to operate not as a penalty, but as acknowledged liquidated damages.

16. INJURY TO WORK: The contractor will be responsible for all injury which may be done to any part of the system until the entire system has been accepted by the City Engineer and City Electrician.

17. LIQUIDATED DAMAGE: Should the contractor fail to complete the system, as provided in these specifications, by the allotted time, he shall pay to the City of New Orleans, not as a penalty, but as acknowledged liquidated damages, the sum of Three Hundred Dollars ($300.00) per day for each and every day that he is delinquent.

18. POLICE AND HEALTH REGULATIONS: (a) The contractor must comply with all Police and Health Regulations and Ordinances; he shall place all necessary guards and barricades, and at night he shall maintain suitable and sufficient lights and necessary watchmen during the construction of the system.

(b) The contractor shall, in the construction of the Light-

ing and Power System, provided for under these specifications, be governed by all existing City Ordinances and State Laws regulating the erection of poles and conductors, and construction of conduits and manholes, for the distribution of electrical energy in and throughout the streets and alleys, and all public buildings. He is especially cautioned against placing conductors in such position as will cause injury to trees.

19. DAMAGE TO PERSONS OR PROPERTY: The contractor shall indemnify and save harmless the city from all claims which may be made by reason of any infringement of any patent right in the use of machinery, lamps, dynamos, or any other article, apparatus or process employed in constructing and installing the system described in these specifications; he shall also indemnify and save harmless the city from all suits and actions that may be brought against it by reason of any injury, or alleged injury, to the person or property of another, resulting from negligence and carelessness in the construction of the Lighting and Power System, or because of failure to properly light and guard the same, or on account of any act of commission or omission on the part of the said contractor, his representatives, or employees.

20. OBSTRUCTING TRAFFIC: The contractor will not be allowed to obstruct private driveways or approaches, or to dig up or occupy the public streets and alleys with materials more than is absolutely necessary for the prosecution of the work; special care will be taken to inconvenience the public as little as possible.

21. LABOR: No alien or foreign unnaturalized labor shall be employed in constructing the system. Preference shall be given to home white labor.

22. MATERIALS: All materials which enter into or form a part of the work required under these specifications, must not only conform to the quality herein specified, but must, in all other respects, be satisfactory and acceptable to the City Engineer and City Electrician.

23. WORKMANSHIP: All work under these specifications must not only be executed as herein specified, but must be first-class and in all other respects executed in a manner satisfactory to the City Engineer and City Electrician.

24. REPLACING PAVEMENTS: The contractor shall replace in a manner satisfactory to the City Engineer and Commissioner of Public Works the street and sidewalk pavements which may be disturbed by him in the construction of the Lighting and Power System described in these specifications, for which he will be paid at the rate named in the proposal; he shall further maintain to the satisfaction of the said officials, for the period of one (1) year after the completion and delivery of the system, all street and sidewalk pavements re-constructed by him, and he shall furnish the City of New Orleans with a bond in an amount of Ten Thousand Dollars ($10,000.00), with a Surety Company acceptable to the Mayor and the City Council as surety for the faithful discharge of this obligation.

25. INSPECTION: The decision of the City Engineer and City Electrician shall be final and binding upon all techni-

cal questions concerning the construction of the Lighting and Power System and in the interpretation of these specifications.

26. ANNULMENT OF CONTRACT: If, at any time, the City Engineer and City Electrician shall be of the opinion that the contractor is wilfully violating any of the provisions of these specifications, or is executing the same in bad faith, they shall advise the contractor wherein they believe the specifications are being violated and at the same time demand correction. Should the contractor fail within five (5) days after receipt of such notification to comply with the specifications, it shall be the duty of the City Engineer and the City Electrician to promptly report the fact to the City Council; the City Council shall have the right to annul the contract, which annulment shall carry with it forfeiture of the full amount of the bond described in Section 13, of these specifications, the forfeiture operating not as a penalty, but as acknowledged liquidated damages.

27. DEBRIS: Upon completion of the system and before acceptance, the contractor shall promptly remove from the buildings and yard premises, all surplus earth, building materials and debris of whatsoever kind; he shall deliver the buildings and grounds in broom clean condition.

28. TEST: Upon the completion of the entire Lighting and Power System the contractor shall notify the City Engineer and City Electrician, in writing, of the fact, and that he is ready to have the same accepted.

He shall, upon receipt of written notice from the City Engineer and City Electrician, that they are ready for final inspec-

tion of the Lighting and Power System, operate the same at his expense, for a period of two hundred and forty (240) consecutive hours to demonstrate that all parts of the system when coupled and working together, not only fulfill the tests prescribed in the detail specifications for the individual parts, but that the entire Lighting and Power System has been fully constructed and completed in accordance with these specifications, and that the entire system is in thoroughly good and satisfactory working condition.

29. PAYMENT: (a) The cost of the Lighting and Power System, and the interest on deferred payments, will be paid from the Alimony and Reserve Fund Accounts in such annual installments as may be necessary to extinguish the entire debt within a period of not exceeding ten (10) years.

(b) Deferred payments will bear interest at the rate of five (5) per centum. per annum. Interest on deferred Alimony Account Payments will be paid from the Alimony appropriation; interest on deferred Reserve Fund Account Payments will be paid from the Reserve Fund appropriation.

(c) The City Council obligates itself to write as Item 1. in the Budget of Expenditures, each year, for ten (10) consecutive years, not less than Eighty-five Thousand Dollars $85,000.00).

The City Council further obligates itself to provide, in ten (10) equal consecutive annual installments, in Item 4. of the Reserve Fund, Budget of Expenditures, such amount, over and above the Eighty-five Thousand Dollars ($85,000.00) that will be written in Item 1. of the Budget of Expenditures, as

may be necessary to entirely and fully liquidate the contract price for the construction of the Lighting and Power System together with accrued interest on deferred payments.

(d) The City of New Orleans reserves the right to, at any time it may elect, cancel any or all outstanding certificates, or to make part payment on outstanding certificates, in which event interest will be paid for the time only that payment of the principal has been deferred.

(e) Partial payment certificates to the extent of 80% of the value of the completed work shall be issued monthly. The said partial payment certificate shall not exceed one-fifteenth part including principal and interest of the total amount to be paid out of the alimony appropriation.

On completion of the entire Lighting and Power System and its acceptance by the City Engineer and City Electrician they will issue to the contractor certificates of payment which shall include all amounts reserved and balances due.

All certificates shall in addition to the signatures of the City Engineer and City Electrician be signed by the Mayor of the City of New Orleans and the Chairman of the Finance Committee of the City of New Orleans.

(f) The amount to be paid annually for principal and interest from Item 1 of the Budget of Expenditures, and the amount to be paid annually for principal and interest from Item 4 of the Reserve Fund, will be included in such number of certificates of such denominations as the contractor may desire. All certificates shall have written or stamped in red ink, across their face, the date of maturity.

SPECIAL SPECIFICATIONS.

GENERATING STATION.

30. GROUNDS—GRADING: (a) South Robertson Street, from Perrilliat Street to Cypress Street, shall be opened and graded according to profiles and cross-sections in the Office of the City Engineer.

(b) That part of the premises now occupied by the Police Jail and Work-house Building, which will remain between the newly opened South Robertson Street and the Girod Street Cemetery, will, hereinafter, be referred to as the "Main Yard;" that part of the premises which will remain between the newly opened South Robertson Street and the Sam'l. J. Peters School property will, hereinafter, be referred to as the "Store Yard."

(c) The Main and Store Yards, together with the sidewalk on Cypress Street and on Perrilliat Street, from the Sam'l. J. Peters School property to the Girod Street Cemetery, as well as the sidewalk on each side of the newly opened South Robertson Street from Perrilliat Street to Cypress Street, shall be graded according to profiles and cross-sections in the Office of the City Engineer; areas that will not be paved shall be sodded.

(d) The grade of the Power House will be approximately

24.8 feet Cairo Datum, which is about equivalent to the present ground elevation. Accordingly, only a small part of the earth, excavated in laying the foundation of the several buildings and the Oil Tank Vault, will be required to grade the Main and Store Yards, South Robertson Street, and the adjacent sidewalks.

(e) No direct compensation will be allowed for grading the Yards, South Robertson Street and adjacent sidewalks. Bidders will note that the price bid for "excavation" must include, not only excavating, but grading and sodding the Grounds. South Robertson Street and adjacent sidewalks, and, removing surplus earth from the premises.

31. OLD MATERIALS: (a) The contractor shall cut down, to the height of the cemetery fences on Perrilliat Street, the existing brick fence along the cemetery side of the Main Yard; he shall cut down, to within about twelve (12) feet of the sidewalk grade, the existing brick fence on Perrilliat and Cypress Streets from the lake side of the newly opened South Robertson Street to the Sam'l. J. Peters School property line; he shall cut down, to within about ten (10) feet of the yard grade, the existing brick fence along the Sam'l. J. Peters School side of the Store Yard. He shall entirely remove the remaining parts of the brick fence surrounding the Police Jail and Workhouse premises, as well as the office building thereon.

(b) The top of the existing fence that has been cut down will be finished with a neat cap or roof formed of mortar.

(c) Bricks removed from the fence and office building that are of suitable character may be used in constructing the Lighting and Power System.

(d) No direct compensation will be made for cutting down, removing, and capping brick fence; the value of the brick removed is deemed adequate compensation for that work.

32. CURB: (a) The two (2) sides of the newly opened South Robertson Street from Perrilliat Street to Cypress Street and Cypress and Perrilliat Street from the Sam'l. J. Peters School property to the Girod Street Cemetery, shall be curbed according to lines and grades shown on the plans in the Office of the City Engineer.

(b) Old curb of proper quality and dimensions shall be relined and reset; old curb shall be beveled or re-beveled as required. All joints shall be thoroughly and neatly pointed with pure cement mortar.

(c) The price, per lineal foot, bid, in the proposal, for resetting old curb will include all necessary handling and work to comply with the preceding paragraph.

(d) Old curb, which cannot be utilized, shall remain the property of the city and shall, without direct cost to the city, be removed by the contractor to the nearest store-ground, and there delivered to the Commissioner of Public Works.

(e) New curb shall be of the best North River Blue Stone or Cabin Creek Blue Stone, or Granite, not less than three (3) inches thick, and in lengths of not less than four (4) feet, and of such depths as may be prescribed by the City Engineer and City Electrician.

(f) New curb stone shall be beveled on top and hammer-faced, and shall have square ends, so as to form close fitting joints; all joints shall be thoroughly and neatly pointed with

pure cement mortar. Where required cuts of proper dimensions, executed in a neat and workmanlike manner, shall be made in both new and old curb for drain pipe outlets; no additional compensation will be allowed for such cuts.

(g) New curb will be paid for, by the superficial foot, at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to place the curb as specified.

33. YARD DRAINS: (a) At the points the City Engineer and City Electrician will designate, yard drains shall be built of the best grade salt glazed vitrified sewer pipe.

(b) The bottom of the trench shall be graded to take the straight portion of each length of pipe, and a hollow shall be scraped out to receive each bell. The joints shall be made with a well caulked toe-gasket, and then filled with mortar composed of one (1) part cement and two (2) parts sand; care shall be taken to swab the joints of the interior of the pipes before the mortar has set.

(c) Catch basins shall be constructed of brick masonry and fitted with suitable cast iron grating.

(d) Yard drains will be paid for, by the lineal foot, at the price bid, in the proposal, for that item; double measurement will be allowed for tees, elbows and other specials. The price bid will cover the pipe and all necessary materials and labor to fully complete the drains for service, except the brick masonry and gratings which will be paid for at the price bid for those items.

34. CESSPOOL: (a) A cesspool shall be built that will measure seven (7) feet six (6) inches inside diameter, and seven (7) feet deep; the walls shall be thirteen (13) inches thick, made of brick masonry, and lined on both inside and outside with pure cement mortar. The cesspool shall have an eighteen (18) inch manhole equipped with a cast iron tight-fitting cover.

(b) The price bid, in the proposal, for the cesspool will include the excavation and all materials and labor necessary to complete it in position for service.

35. WATER MAINS: (a) A first quality four (4) inch cast iron bell and spigot water main shall be laid, according to the most modern and approved methods, from and connected with the existing four (4) inch water main on Perrilliat Street along Girod Street Cemetery side of the Main Yard to Cypress Street, thence along Cypress Street and South Robertson Street back to and connected with main on Perrilliat Street, thus completing a loop around two (2) sides and one (1) end of the Main Yard. This loop shall be equipped with a cut-off placed near each end on Perrilliat Street.

(b) A branch shall be laid from the loop, at the most convenient point, to the pumps situated in the boiler room. This branch shall be fitted with a cut-off placed near the pumps.

(c) Another branch shall be laid from the loop, at the most convenient point, to the water trough situated in the yard.

(d) Both branches shall be the same size and quality pipes as the main described in paragraph (a) and laid in the manner therein prescribed.

(e) A four (4) inch main, of the quality, and laid in the manner prescribed in paragraph (a), shall be laid from the existing four (4) inch water main on Perrilliat Street to a point which the City Engineer and City Electrician will designate in the store yard.

(f) The four (4) inch water mains and branches will be paid for, by the lineal foot, at the price bid, in the proposal, for that item. Double measurement will be allowed for elbows, tees and other specials. The price bid will include all materials and labor necessary to complete the mains and branches in position for service.

36. FIRE HYDRANTS: (a) At the four (4) points in the Main Yard indicated on the plans in the Office of the City Engineer, there shall be placed and connected with the four (4) inch water main, a standard fire hydrant with double outlet. Outlets shall measure two and one-half (2½) inches in diameter, and the nozzles shall be equipped with standard hose threads.

(b) Hydrants will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to complete the hydrants in position for service.

37. RISERS: (a) Two (2), one and one-half (1½) inch cast iron risers, connected with the four (4) inch branch water pipe, and extending about four (4) feet above the ground surface, shall be placed at the water trough in the Main Yard, and two (2) at the water trough in the Store Yard. Each riser shall be fitted with a one (1) inch brass faucet; the faucets shall be threaded for hose connections.

(b) Risers will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to complete the risers in position for service.

38. WATER TROUGHS: (a) One water trough shall be erected in the Main Yard between the large doors in front of the Stable Building, and one water trough shall be erected in the Store Yard at a point which will be designated by the City Engineer and City Electrician.

(b) Water troughs shall measure fourteen (14) feet long by thirty (30) inches wide by twenty-four (24) inches deep. They shall be neat in pattern and design, and made of one-quarter (¼) inch steel, closely riveted and water tight. The troughs shall be set on substantial metal legs.

(c) Each trough shall be fitted with a cast iron overflow pipe leading to and connected with the nearest yard drain.

(d) Water troughs will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to complete the water troughs in position for service.

39. ARTIFICIAL STONE PAVEMENT: (a) The areas indicated on the plans in the Office of the City Engineer shall be paved with artificial stone.

(b) Artificial stone pavement shall be formed of a foundation course of four (4) inches of concrete, on which, before the concrete has set, there shall be laid a top course of cement mortar one (1) inch thick, the surface of which, shall be evenly troweled and brought to a polished finish.

(c) Artificial stone pavement shall be divided in blocks, of such dimensions as the City Engineer and City Electrician may direct, in the usual manner with tar paper strips.

(d) The surface of the earth upon which the concrete foundation will rest, shall be carefully graded and tamped, to insure thorough compaction.

(e) The concrete shall be rammed in position until an excess of mortar shows on the surface.

(f) The surface course shall be formed by intimately mixing one (1) part cement and one (1) part sand with just enough water added to produce a mortar of the proper working consistency.

In finishing and polishing the surface course pure artificial cement shall be used as a drier.

(g) Artificial stone pavement will be paid for, by the square yard, at the price bid, in the proposal, for that item; double measurement will be allowed for coping. The price bid will include the concrete foundation and surface course, as well as all other materials and work necessary to complete the pavement from and including the sub-grade to the finished surface.

40. VITRIFIED BRICK PAVEMENT: (a) The areas designated on the plans in the Office of the City Engineer, including a drive-way across South Robertson Street to connect the Main and Store Yards, shall be paved with vitrified brick.

(b) Vitrified Brick Pavement shall be formed of a foundation course of six (6) inches of concrete, a cushion course of one and one-half (1½) inches of sand, and a surface course of the best grade Vitrified Paving Brick.

(c) The surface of the earth upon which the concrete foundation will rest, shall be prepared in the manner described for Artificial Stone Pavement, and the concrete shall be similarly laid.

(d) When the concrete has thoroughly set, there shall be laid on it a course of sand measuring not less than one and one-half (1½) inches in thickness when compacted.

(e) On the sand there shall be laid a surface course of the best quality Vitrified Paving Brick. The brick shall be homogeneous and compact in structure, free from loose lumps of uncrushed clay, or from laminations caused by the process of manufacture, or fire cracks or checks of more than superficial character or extent. Distorted bricks, that will not lie even in the pavement, shall not be employed.

(f) No bats or broken bricks shall be used except at the curbs, where nothing less than half a brick shall be used to break joints. The bricks shall be laid in straight lines, and all joints broken by a lap of at least two (2) inches. The bricks shall be set upright on the sand and at right angles to the line of the curb, unless otherwise specially directed by the City Engineer and City Electrician, and as close together as practicable. To insure compactness, the bricks shall be well rammed laterally with proper appliances, in tiers of not more than six (6) courses.

(g) The pavement shall be thoroughly rammed two (2) or three (3) times as may be directed by the City Engineer and City Electrican, with a paving rammer, weighing not less than seventy-five (75) pounds, or rolled with a road roller, weighing not less than three (3) nor more than six (6) tons.

(h) All joints in the pavement shall be completely filled with a liquid grout formed of cement and sand mixed in equal parts.

(i) Vitrified Brick pavement will be paid for, by the square yard, at the price bid, in the proposal, for that item. The price bid will include the concrete foundation, sand course, and brick surface, as well as all other materials and labor necessary to complete the pavement from and including the sub-grade to the finished surface.

41. GUTTER BRIDGES: (a) At the points indicated on the plans in the Office of the City Engineer, cast iron bridges of the design, weight and dimensions which will be designated by the City Engineer and City Electrician, shall be placed over the street gutters.

(b) Gutter bridges will be paid for, by the pound of weight, at the price bid, in the proposal, for iron castings. The price bid will include all materials and labor necessary to place the bridges in position for service.

42. FRAME SHED: (a) In the Store Yard there shall be erected on small brick masonry ground piers, a frame shed, of the dimensions and style of construction shown on the plans in the Office of the City Engineer. Undressed pine lumber, merchantable grade, shall be used.

(b) The shed shall be covered with the best quality Blue Bangor Slate. Slates shall measure sixteen (16) inches by ten (10) inches; they shall be laid with a lap of three (3) inches, and double nailed.

(c) The exposed wood work, forming the shed, shall be given two (2) coats of best quality whitewash.

(d) The shed will be paid for at the price bid, in the proposal, for that item. The price bid will cover all materials and labor necessary to fully and entirely complete the shed.

43. FEATHER-EDGE BOARD FENCE: (a) There shall be built on the lake side of the newly opened South Robertson Street, to complete the enclosure of the Store Yard, a feather-edge board fence constructed of undressed pine lumber, merchantable grade. The ends of this board fence shall be substantially and neatly connected with the brick fence.

(b) The fence shall extend twelve (12) feet above the sidewalk; it shall be formed of six by eight (6x8) inch posts penetrating the ground four (4) feet, and spaced not more than eight (8) feet from centres apart, and horizontal boards securey nailed to the posts; the boards shall be one (1) inch thick and about twelve (12) inches wide.

(c) One double gate, measuring ten (10) feet over all in width, shall be built in the fence, at a point which the City Engineer and City Electrician will designate. The gate shall be made of the same kind of lumber as the fence and substantially framed; the gate posts shall measure ten (10) inches by ten (10) inches. The gate shall be hung at each side on three large strap hinges, and made to fasten with large lock and key.

(d) Both sides of the feather-edge board fence and the gate shall be given two (2) coats of first quality whitewash.

(e) The feather-edge board fence, including the gate and fastenings, will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to fully and entirely complete the fence and gate.

44. SWITCH TRACK: (a) There shall be constructed from, and connected to standard switch with, the main line of the Yazoo & Mississippi Valley R. R. Co. on Poydras Street, through South Robertson Street to Cypress Street, a single line, standard gauge, railroad track, according to lines and levels which the City Engineer will furnish.

(b) The surface of the ground upon which the cross-ties will rest, and for a space of six (6) inches outside their ends, shall be graded; upon the sub-grade there shall be laid lengthwise with the track, a course of one (1) inch by twelve (12) inches pecky cypress boards.

(c) On the plank floor there shall be placed sand and gravel for a thickness of six (6) inches. The sand and gravel shall be mixed in the proportion of two (2) parts sand and one (1) part gravel.

(d) Cross ties shall be either cypress or pine, sound and free of sap, sawed or hewn, and measure nine (9) feet by eight (8) inches by six (6) inches; they shall be placed twenty-one (21) inches from centres apart and laid on top of the sand and gravel.

(e) Standard steel "T" rails, weighing not less than sixty (60) pounds to the lineal yard, shall be used. The rails shall be spiked on both sides to each cross tie with standard railroad spikes. Standard fish plates, bolts, etc., shall be used to couple the rails.

(f) The space between the top of the cross-ties and the top of the gravel and sand, for the full length of the cross-ties, shall be filled with sand and gravel mixed in the proportion described in paragraph (c).

(g). The space between the top of the cross-ties and the top of the rails shall be filled in and tamped with earth.

(h) At Lafayette and Perrilliat Streets, the space between the rails and for one foot outside of each rail, for the width of those streets, shall be floored with three (3) inches by twelve (12) inches good quality pine boards.

(i) The switch track will be paid for at the price bid, in the posal, for that item. The price bid will include all materials and labor necessary to fully and entirely complete the track for service.

45. EQUIPMENT: The Grounds shall be equipped with the following:

(a) A substantial hose hand carriage, metal reel, capable of holding two hundred (200) feet of hose, and four (4) lengths of fifty (50) feet each, standard rubber lined, twilled cotton covered hose, two and one-half (2½) inches in diameter, capable of sustaining one hundred and fifty (150) pounds pressure. The hose shall be equipped with end couplings, and two (2) brass, three-quarters (¾) inch, nozzles.

(b) Two hundred (200) feet of standard one (1) inch, wire wrapped, garden rubber hose, in standard lengths, equipped with end couplings and two (2), one-half (½), brass nozzles. The hose shall be rolled on two (2) metal reels fixed on wrought iron brackets to the wall of the Stable and Office Building, nearby the water trough.

(c) One seventeen (17) inch Continental, or other equally as good, hand lawn mower.

(d) Equipment will be paid for at the price bid, in the pro-

posal, for that item. The price bid will include all materials and labor necessary to fully and entirely complete the equipment.

MATERIALS FOR GENERAL USE.

46. CEMENT: (a) Artificial cement of high grade only will be used in constructing all parts of the Lighting and Power System.

At least ninety-seven (97) per cent. of the cement, by weight, shall pass through a sieve with two thousand five hundred (2500) meshes to the square inch. The cement shall stand a tensile stress of at least four hundred (400) pounds to the square inch when mixed neat, and exposed one (1) day in air and six (6) days in water, and when mixed in the proportion by weight of one (1) part cement to three (3) parts sand, and exposed in the same manner, it shall stand a tensile stress of one hundred and twenty-five (125) pounds per square inch. A cement that cracks or checks when made into thin cakes, or that begins to set in less than thirty (30) minutes, will not be accepted.

(b) No cement shall enter the work until it has been tested in the Office of the City Engineer and accepted by him, the test to extend over such length of time not exceeding twenty-eight (28) days, as the City Engineer may deem necessary.

In making tests, samples will be taken from as many packages as the City Engineer may elect, and the failure of one-tenth (1-10) of the samples taken from any given lot of cement will justify the rejection of the entire lot. All cement must be delivered on the work in original packages, bearing the name, brand or stamp of the manufacturer. While in storage or upon the work, or while being hauled to or handled on the work, cement must be properly protected; no cement shall be used which, in the opinion of the City Engineer and City Electrician, has been injured by age or exposure.

47. SAND: All sand used in constructing the Lighting and Power System shall be clean and sharp, containing both fine and coarse grains; it shall be free from sewage, mud, clay and mica, paper, leaves, chips, and other foreign matter, and not show when shaken with water and after subsidence more than five (5) per cent. by volume, of silt.

48. CONCRETE: (a) Concrete shall be formed by intimately mixing one (1) part cement, three (3) parts sand, water, and an aggregate of broken stone, or gravel, free from all foreign substance, in such quantity that the mixture shall contain not less than twenty (20) per cent. more mortar than the volume of voids determined by saturation.

(b) If the mixing be done by hand the cement and sand shall be first thoroughly mixed dry on an approved water-tight platform, and then made into mortar with the least possible amount of water; the aggregate which must be drenched before being placed in the wheelbarrows, shall be added to the mortar. The mass shall be continued to be turned over with shovels or hoes until every particle of the aggregate is completely enveloped with mortar.

(c) The concrete will be mixed by either hand or approved machinery in the most expeditious manner possible, and at once placed in the work as the City Engineer and City Electrician may direct, and thoroughly rammed in position. A larger amount of concrete than can be made with one (1) barrel of cement shall not be mixed in one (1) batch by hand.

49. MORTAR: Mortar shall be formed by intimately mixing one (1) part cement, three (3) parts sand, and just enough water to produce a mixture of proper working consistency. Where not otherwise described, the term "mortar," in these specifications, means the foregoing mixture.

50. BRICK MASONRY: Brick masonry shall be composed of good hard burned, Lake or Jackson R. R. Brick, or their equal, laid in mortar.

Bricks shall be thoroughly wetted in advance and laid in a full bed of mortar. All outside joints shall be shoved and made flush and true; all inside courses shall be thoroughly grouted.

51. CAST AND WROUGHT IRON: (a) Castings shall be made of tough gray iron, free from injurious cold-shuts or blow-holes, true to pattern and finish.

(b) Wrought iron shall be ductile and fibrous, straight and smooth, free from buckles, blisters, cracks or cinder pockets.

(c) Wrought and cast iron members before leaving factory at which they are made, shall be thoroughly cleaned and freed of scales or rust and then given one (1) coat of metallic paint of the quality described in paragraph (e) of the following Section: on reception at the building, and before being placed

in position, they shall again be thoroughly cleaned and freed of scales or rust, and then given a second coat of the specified metallic paint

52. STEEL: (a) Rolled pieces shall be of uniform thickness and smooth surface, free from flaws and defects, and made of standard mild steel. Elongation in its cold and finished state will be limited to a maximum of twenty (20) per cent. in eight (8) inches, and reduction of area at fracture will be limited to a maximum of forty (40) per cent.; pieces shall be capable of bending one hundred and eighty (180) degrees to a diameter equal to the thickness of the pieces tested, without sign of fracture on the outside of the bent portion.

(b) Two (2) pieces from each heat or blow-off of the finished material that will enter the building, shall be tested, one for tension and one for bending. The pieces tested shall have as near one-half (½) square inch sectional area as practicable. The elongation will be measured on an original length of eight inches. The tested pieces must have an ultimate strength of 60,000 to 68,000 pounds per square inch; elasticity will be limited to one-half (½) of the ultimate strength.

(c) Reports of tests shall be furnished to the City Engineer and City Electrician of New Orleans and duly certified to by the manufacturer before any pieces, made from the run that has been tested, will be allowed to enter the building.

(d) Steel members must be thoroughly cleaned and freed of scales or rust and given one (1) full coat of boiled linseed oil at the factory where they are rolled; painting in lieu of oiling will not be permitted.

(e) After reception at the building, and before being placed in position, steel members shall be thoroughly cleaned and freed of scales or rust, and then given two (2) coats of the best grade of metallic paint mixed in proper proportion with boiled and raw linseed oil.

POWER HOUSE BUILDING.

53. PILES: (a) Piles shall be long leaf, yellow pine, bark-stripped, straight and free of imperfections; they shall measure not less than nine (9) inches in diameter at the small end, and such length as the City Engineer and City Electrician may direct. Piles shall be driven vertically true.

Experience in driving piles for the foundation of other buildings in the vicinity of the Generating Station, developed a hard stratum at about forty (40) feet beneath the surface of the ground; it is accordingly believed that piles not longer than forty (40) feet will be required. The contractor shall first drive five (5) sixty (60) foot piles to determine the required length of piles, the intention being to develop by test to what length piles must be driven in order to minimize waste in cut-offs.

(b) The piles under the Power House and the Power House walls shall be cut-off true and level at a point three (3) feet below the grade of the building.

(c) The piles that will be driven for the future extension of the Power House, will be cut off just enough below the ground surface to permit the yard pavements being properly laid.

(d) Piles will be paid for, by the lineal foot in place after the cut-off has been made, at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to place the piles in position and condition to receive the concrete foundation.

54. EXCAVATION: (a) Such excavation as may be necessary to properly place the concrete foundation shall be made; it is estimated that the excavation will extend no more than three and one-half (3½) feet below the present ground surface.

(b) Excavation will be paid for, by the cubic yard, at the price bid, in the proposal, for that item. The price bid will include the work of excavating, refilling and tamping, and removing surplus earth from the premises.

(c) The contractor shall be careful not to make the excavations of greater dimensions than the City Engineer and City Electrician prescribe; should he excavate to a greater extent than the City Engineer and City Electrician have designated, he shall receive no compensation for the excess excavation.

(d) The contractor shall be responsible for sloughing, and he shall, at his expense, take such steps as may be necessary to provide against sloughing; no compensation will be allowed for removing earth which has sloughed into the pit, or for refilling and tamping the cavities so created.

(e) The contractor shall, at his expense, do such pumping as may be necessary to keep the trenches free of water so that the excavation may be completed and the foundation satisfactorily placed.

55. FOUNDATION: (a) In addition to the piles the foundation shall be composed of a mass of concrete, three and one-half (3½) feet in thickness, increased to about four and one-half (4½) feet in thickness under the chimney; the concrete shall be laid in courses of not more than twelve (12) inches in thickness, as may be directed by the City Engineer and City Electrician. In general the concrete shall extend six (6) inches below the top of the piles; "I" beams will be imbedded in the concrete under the chimney, as shown on the plans in the Office of the City Engineer.

(b) The surface of the concrete foundation between the inside of the walls of both sections of the building, shall be sloped from the sides and ends so as to drain to a pool at the centres; this surface shall be covered for a thickness of one-half (½) inch with mortar of the quality employed in the surface course of artificial stone pavement.

(c) The concrete foundation will be paid for at the price bid, in the proposal, for concrete. The "I" beams under the chimney and the surface course will not be directly paid for; their value will be included in the price bid for the Power House.

56. FOOTINGS: Wall and Engine pier footings shall be built of brick masonry, and of the dimensions shown on the plans in the Office of the City Engineer.

57. ENGINE PIERS: Engine piers and three (3) piers for condensers, four (4) piers for boiler feed pumps, one (1) pier for fire pump and two (2) piers for fuel oil pumps, shall be built of brick masonry and of the dimensions shown on the

plans in the Office of the City Engineer; where the dimensions are not shown on the plans, the piers shall be of suitable size. The piers will not be directly paid for at the price bid for brick masonry; their value will be included in the price bid on the Power House.

58. WALLS: (a) The walls shall be built of brick masonry and of the dimensions shown on the plans in the Office of the City Engineer.

(b) Two (2) damp courses, consisting of one (1) large size whole slate each, bedded in mortar, shall extend through all walls and piers.

59. IRON AND STEEL MEMBERS: Iron and steel members forming the building, and the roof, floor and yard shed frames, shall be of the quality described in Sections 51 and 52 of these specifications, and of the dimensions and placed as shown on the plans in the Office of the City Engineer.

Members shall be rivetted or bolted together according to the best methods practiced in iron and steel structural work.

60. STEEL COLUMNS: Steel columns shall rest on a cast iron base plate. Base plates shall be planed and brought to true surface and securely bolted to a granite block; granite blocks shall be partially embedded in the concrete foundation.

61. BEAMS AND GIRDERS: (a) Beams and channels shall bear not less than nine (9) inches on the walls; girders, single or double, shall bear not less than thirteen (13) inches on the walls. Where two (2) beams form a girder, heavy standard separators shall be employed and the beams shall be bolt-

ed at intervals of six (6) feet. Beams and girders which connect shall be neatly coped and fastened with standard angles. Beams of relative short length, which may be loaded to their full capacity, shall be strengthened by the use of connections of greater thickness.

(b) Floor beams shall be tied together with three-quarter (¾) inch wrought iron rods at intervals of from five (5) to six (6) feet.

62. WALL ANCHORS: (a) Walls shall be thoroughly bonded at points of contact. Side walls shall be tied to end walls, and division walls shall be tied to side and end walls, at intervals of four (4) feet in height with wrought iron anchors, measuring two and one-half by three-eighths (2½x⅜) inches and extending not less than two (2) feet six (6) inches in both directions; each end shall be split, one end turned up and the other end turned down.

(b) "I" beams, next to and paralleling the walls, shall be anchored to the masonry at intervals of about six (6) feet; "I" beams joining masonry at their ends shall be anchored to the masonry.

63. LINTELS: Masonry, over square head openings, shall rest on a cast iron lintel, not less than three-quarters (¾) of an inch thick, having flanges equal to the full width of the wall and webs two (2) inches high at ends; webs shall increase in height by one and one-half (1½) inches for every twelve (12) inches the span is increased. Lintels of eighteen (18) inches or more breadth shall be cast with double web. Where required skew backs shall be cast on the lintels. Lintels shall bear on the wall not less than eight (8) inches at each end.

64. PRESSED AND ENAMEL BRICK FACINGS: (a) The exterior walls of both sections of the building shall be faced with best selected and matched Salmen Pressed Brick, with moulded brick arches and courses of such colors as may be designated by the City Engineer and City Electrician.

(b) The walls in the engine room, for a height of about twelve (12) feet above the floor, shall be faced with best grade white enamel brick, and such colored enamel brick as the City Engineer and City Electrician may designate to form a border, at top.

(c) The walls between the basement floor and the engine room floor, will not be faced with pressed brick; all exposed brick masonry between the steel floor and the engine room floor shall be given two (2) coats of best quality whitewash.

Except in the two (2) lavatories, all other walls in the interior of both sections of the building, shall be faced with pressed brick of the kind and quality described in paragraph (a).

(d) Face brick shall be bonded every sixth course, eighteen (18) inches apart longitudinally, with Morse Patent Steel Wall Ties, or other equally as good, size about seven (7) inches by one-eighth (1/8) inch; all ties shall be dipped in asphaltum paint three days before being placed.

(e) Window and door frames shall be carefully and solidly bedded in the walls and sills shall be under-pinned with mortar.

(f) Pressed brick and terra cotta shall be laid in mortar and covered as directed with Sterling Mortar Stain; pressed brick and terra cotta joints shall be uniformly three-sixteenths (3-16) of an inch thick and neatly tooled.

65. TERRA COTTA: (a) Terra cotta shall be semi-glazed, burned straight and even, free from warps and other defects, irregularly combed surface, and of such color as the City Engineer and City Electrician will designate.

(b) The exterior surfaces to be faced with terra cotta are indicated on the plans in the Office of the City Engineer.

(c) Terra cotta pieces shall be tied to brick masonry with iron anchors, and additionally, thoroughly bedded in mortar, of such color as may be designated by the City Engineer and City Electrician.

66. CORNER STONE: The corner stone shall be of Georgia White Marble, measuring on exposed surfaces the length of about three (3) brick by the height of about seven (7) courses of brick. The exposed sides of the stone shall be polished, and the inscription shall be cut in "V" shaped and gilded letters.

67. CLEANING: All pressed brick and terra cotta surfaces shall after completion of the building, be thoroughly cleaned with a weak solution of Muriatic Acid and given two (2) coats of raw linseed oil.

68. ROOF COVERING: The roof of both sections of the building, and the roof of the yard shed, shall be covered with first quality "book" roof tiles, free from all imperfections; tiles including the usual surfacing with pitch and gravel, will be laid in the most approved and modern manner.

69. SKYLIGHTS: (a) On the roof of each section of the building, a skylight shall be built of the style and dimensions shown on the plans in the Office of the City Engineer. The frames shall be made of steel.

(b) Both sides of each skylight shall be equipped with deep louvres.

(c) The top of each skylight shall be covered with first quality ribbed and frosted heavy glass.

(d) On top of each skylight there shall be placed three (3) twenty (20) inch Star Ventilators of Merchant & Co.'s make. or other equally as good.

(e) For the entire length of each skylight there shall be built, a foot-walk formed of five-sixteenths (5-16) inch checkered steel plates, and fitted with double hand rail. The plates shall be of the quality and laid in the manner described in Section 75 of these specifications.

70. GUTTERS, VALLEYS AND FLASHINGS: (a) Gutters and valleys shall be made of twelve (12) ounce copper, of suitable width, riveted and soldered. Flashings shall be made of same weight material, required width, and, counter flashed.

(b) Down pipes shall be made of No. 26 galvanized iron; each down pipe shall be connected with yard drain and fitted with a cast iron guard box, five (5) feet high.

71 LIGHTNING RODS: (a) There shall be erected on the Power House three lightning conductors.

(b) Lightning conductors shall be made of copper cables weighing not less than eight (8) ounces to the lineal foot; the wires forming the cable shall be No. 10 B. & S. gauge.

(c) The conductors shall be firmly fastened by means of copper cleats or staples to the roof and walls of the building without the use of glass or other insulators. Where practi-

cable the metal work forming part of the roof of the building shall be connected electrically with the conductors. The ground connections of each conductor shall consist of a plate of copper three (3) feet square by one-half (½) inch thick. Ground plates shall be buried ten (10) feet deep. The connections of the conductor with the ground plate shall be made electrically perfect.

(d) That section of a conductor projecting above the roof shall be a solid copper rod having the same number of square inches of surface per foot of length as the cable. The rods shall be firmly supported on neat stands to insure stability. The top of each rod shall be equipped with several projecting, heavily plated, terminal points.

(e) One conductor shall be placed near the Cypress end of each skylight; these conductors may be connected on the roof and carried to one ground plate with a single conductor. One conductor shall be attached to the chimney; the rod shall project not less than four (4) feet above the highest point of support.

72. DOORS AND WINDOWS: (a) Full seasoned cypress "A" grade lumber, under the classification adopted by the Mechanics', Dealers' & Lumbermen's Exchange of New Orleans, shall be employed in making all windows and door frames, doors and window sash; the frames, doors and sash shall be given a priming coat of paint before being placed in position.

(b) Door and window sills shall be made of Georgia white marble and polished.

(c) Doors and windows throughout the building will be of the dimensions shown on the plans in the Office of the City Engineer and of standard construction.

(d) Doors shall be solid moulded with raised panels; two (2) of the interior doors shall be glazed.

The main doors, both upstairs and downstairs at the front of the building, shall be extra heavy and glazed; these doors shall be fitted with glazed transoms and glazed side panels.

(e) All interior doorways, in addition to the doors already described, shall be equipped with a standard fire door, of the quality and style prescribed by the Board of Fire Underwriters.

(f) The sash of the semi-circular windows shall be stationary; all other sash shall be checked, bored and double hung to raise and lower with Silver Lake, or other equally as good sash cord and cast iron weights.

73. GLAZING: (a) All windows, and the doors specified in paragraph (d) of the preceding section, shall be glazed with "A" grade double thick American Glass.

(b) Window sash and doors shall be primed as prescribed, before they are glazed, and the glass shall be well bedded, tacked and puttied.

74. HARDWARE: (a) Hinges shall be bronzed steel of suitable size and of Stanley, or other equally as good, manufacture.

(b) Locks shall be of suitable size, Corbin, or other equally as good, manufacture. Those on the front doors shall be bronze, mortised and rabbeted; all others shall be bronzed steel.

(c) The front doors shall be equipped with bronze flush bolts of suitable size; other double doors shall be fitted with top and bottom bolts and chains.

(d) Each window that raises and lowers with sash cord and weights, shall be fitted with two (2) bronzed steel sash lifts and one (1) bronzed steel sash lock of suitable size.

(e) Each window that raises and lowers with sash cord and weights, shall be equipped with a set of four (4) anti-friction frame pulleys of suitable size.

(f) Transoms shall be fitted with bronze transom centres and lifts.

75. STEEL FLOOR: (a) At a point three (3) feet above the basement floor in both sections of the building, and over the upper lavatory, there shall be built, as shown on the plans in the office of the City Engineer, a checkered steel floor.

(b) Steel plates forming the floor shall be five-sixteenths (5-16) of an inch thick, and of such length and breadth as may be necessary to span from "I" beam to "I" beam upon which they will bear. Each plate shall be firmly secured to "I" beams with not less than four (4) three-eighths (3/8) inch, counter-sunk head, Muntz Metal Screws.

(c) Next to the wall and for the entire length of the boiler room, at the elevation of the floor over the upper lavatory and connected therewith, there shall be built a foot-walk formed of five-sixteenths (5-16) inch checkered steel plates, and fitted with a double hand rail; the plates shall be securely fastened to the supporting frame with counter-sunk head, Muntz Metal Screws.

76. ENGINE ROOM FLOOR: (a) The engine room floor shall be formed of brick masonry arches between "I" beams brought to true surface with concrete, and covered with tiles.

(b) The surface of the floor shall be formed of mortar and vitrous tiles, Star Encaustic Co., or other equally as good, manufacture. The main tiles shall be octagon in shape, white in color, and measure four and one-quarter (4¼) inches; the interval between those tiles shall be filled with two (2) inch square tiles, blue in color.

(c) Around the four (4) walls, all openings, and the engine room piers, a boiler shall be laid twelve (12) inches wide, formed of white, blue and pink vitrous tiles, of such sizes and shapes as may be required to correspond with the size and color of the tiles forming the body of the floor.

(d) Tiles shall be uniform in color and free of warps and all other defects.

(e) The tiles shall be laid on a course of mortar about one (1) inch in thickness; the mortar shall be formed by intimately mixing one (1) part cement, two (2) parts sand and just enough water to make a mixture of proper working consistency.

The tiles shall be carefully and evenly embedded in the mortar before it has set. Joints shall be made flush and true; joints shall be grouted with pure cement mortar neatly tooled.

(f) Bidder will note that the entire engine room will not be floored; to afford light and ventilation, openings as shown on the plans in the Office of the City Engineer will be left in the floor. Such openings shall be enclosed with a neat hollow polished brass, double hand-rail, fitted with standard connections, etc., so that the rails may be readily removed.

77. SWITCH-BOARD FLOOR: (a) The switch-board floor shall be constructed of white marble slabs, about one (1) inch in thickness, egg shell top finish, and of such length and breadth as may be necessary to span from "I" beam to "I" beam upon which they rest, and from wall to front of floor. The slabs shall be laid on the "I" beams on a thin bed of pure cement mortar; all joints shall be even and true grouted with the same kind of mortar, and neatly troweled.

(b) The hand rails of the stairs leading from the engine room floor to the switch-board floor, and the hand rail along the switch-board floor, shall be made of hard wood, finished in oil.

78. ECONOMIZER ROOM FLOOR: The floor above the boilers on which the economizers will be placed, shall be built as follows:

The space to be occupied by the economizers shall be formed of corrugated iron arches between the "I" beams, and brought to true surface with concrete. The remaining space around the economizers shall be floored with checkered steel plates of the quality and dimensions, and laid in the manner described in Section 75 of these specifications.

79. BOILER ROOM YARD SHED: On the South Robertson Street side of the Power House there shall be built, for the entire length of the boiler room, over the boiler room doors, a shed ten (10) feet wide framed and covered as described in Sections 59 and 68 of these specifications. The shed shall be supported on metal brackets, of neat design, securely anchored to the wall.

80. STEEL ROLLING BLINDS: Each of the large doors opening into the yard from the boiler room shall be fitted with a heavy steel rolling blind. The blind shall be of the best type and manufacture and long enough to reach the floor. Brackets carrying blinds shall be fastened to the "Z" bar columns.

81. BOILER ROOM DOOR STEP: In front of the boiler room, for its entire length, a step leading from the yard pavement to the steel floor in the boiler room shall be built. The step shall be formed of brick masonry covered with one-half (½) inch of mortar, composed of one (1) part sand and one (1) part cement, neatly troweled and brought to a polished surface.

82. STAIRS: (a) All stairs inside the building shall be made of iron of neat pattern and design, and of the dimensions and placed as shown on the plans in the Office of the City Engineer.

(b) The hand rail of the three (3) small stairs in the engine room floor openings, leading to the steel floor below, shall be made hollow and of polished brass.

(c) The stairs on the outside of the building at the front entrance, including the landing, shall be made entirely of iron, ornamental in pattern and design.

(d) The two (2) iron ornamental lamp posts equipped with ornamental lamps shall be erected on the landing.

83. LAVATORIES: (a) One lavatory shall be built on the ground floor at the front end of the boiler room section of the building, and one lavatory shall be built immediately over

the first at about the same elevation as the engine room floor.

(b) Each lavatory shall be equipped with the number of shower baths, water-closets, washstands, urinals and lockers shown on the plans in the Office of the City Engineer.

(c) The floor of the upper lavatory shall be formed of corrugated iron arches between the "I" beams, and brought to true surface with concrete on which there shall be placed a surface course one (1) inch in thickness of mortar, of the quality employed in the surface course of artificial stone pavement.

(d) The floor of the lower lavatory shall be formed of artificial stone pavement, which shall rest upon a filling of good clean earth, thoroughly compacted, placed on top of the concrete foundation.

(e) The lavatory floors shall be sloped so as to drain to a convenient point for connection with the main waste pipe.

(f) The walls and ceilings of the lavatories shall be faced with six (6) inch by three (3) inch standard first grade wall tiles, of such colors and placed to form such patterns as the City Engineer and City Electrician may designate.

(g) The brick masonry walls shall be furred with seven-eighths (7/8) inch by two (2) inch cypress strips, spaced about sixteen (16) inches from centres apart, and the "I" beams forming the ceiling joists shall be fitted with channel irons to support the lathing.

(h) The walls and ceiling shall be lathed with expanded metal of suitable weight and size mesh; on the expanded metal there shall be placed a course of Acme Fibrous mortar, three-

eighths (⅜) of an inch thick. This course shall be scratched to roughen it before it has dried out, and there shall then be added a course of mortar mixed in the proportion of one (1) part cement and two (2) parts sand about three-eighths (⅜) of an inch in thickness.

The tiles shall be carefully and evenly embedded in the mortar before it has set. Joints shall be made flush and true; joints shall be grouted with pure cement mortar and neatly tooled.

(i) Partitions between baths, water-closets and urinals shall be made of good quality white marble and polished. Partitions shall extend seven (7) feet six (6) inches above the floor; they shall be supported at the outer end by one (1) brass leg six (6) inches high, and the inner end shall be securely anchored to the wall.

(j) Water-closets and baths shall be equipped with a half size swinging shutter door, made of the best grade, full seasoned cypress and finished in hard oil.

(k) Shower attachments shall be of a neat design and standard manufacture. Each bath shall be equipped with a hot and cold water connections; also, a grated run-off, connected with the main waste pipe.

(l) The water-closets shall be porcelain ware syphon jet, fitted with raising seat made of oak, and an eight (8) gallon copper lined oak tank; water-closets shall be equipped with modern sanitary vent pipes of suitable size.

(m) Washstands shall be enamel Sectional Lavatories, enamel iron back, supported by two heavy cast iron brackets;

the bowls shall measure about twenty-four (24) inches by eighteen (18) inches, and be fitted with chains, snaps, stoppers and two (2) self-closing brass faucets. Washstands shall be equipped with both hot and cold water connections.

(n) Urinal bowls shall be made of best quality porcelain, and neat design; they shall be equipped with water connection for continuous flushing.

(o) The main water supply pipes shall be made of cast iron and measure four (4) inches in diameter.

(p) The waste from the water-closets and urinals shall be conducted to the cesspool in the yard by extra heavy cast iron pipes of suitable size, fitted with extra cast iron bends, "Y's," "T's," etc. Waste from the washstands, shower baths and floor drains, shall be conducted by galvanized iron pipes of suitable size to the nearest yard drain.

Waste pipes shall not be laid truly horizontal; to insure free flow through them, they shall be laid with uniform slope of not less than one-half (½) inch vertical to twelve (12) inches horizontal.

(q) All pipes and fittings shall be laid in accordance with the most modern sanitary methods and regulations, and where practicable pipes shall be exposed.

Pockets in water pipes shall be provided with a suitable bleeder to insure thorough drainage when desired.

(r) All attachments and fittings forming a part of the shower baths, water-closets, washstands and urinals, shall be of the most modern type and of polished brass.

(s) Heavy steel wicker lockers shall be placed in each lava-

tory where shown on the plans in the Office of the City Engineer. The lockers shall extend about eight (8) feet above the floor. The tops shall be formed of the same material as the partitions. The door shall be made of the same material as the sides and top; doors shall be fitted with a spring lock and duplicate key.

Lockers shall be substantially framed with angle irons and securely fastened to the wall and the floor. Each locker shall be fitted with six (6) bronzed steel clothes hooks and two (2) cypress board shelves, finished in hard oil.

The lockers shall be given two (2) coats of the best quality enamel paint, of such color as the City Engineer and City Electrician may designate.

84. PAINTING: (a) All exterior metal and wood work, and such surfaces as in common practice are painted, shall, in addition to a priming coat be given two (2) coats of best grade oil, lead and zinc paint, of such colors as the City Engineer and City Electrician may designate.

(b) Both sides of doors and all interior wood work shall be finished in hard oil.

(c) All oils, lead, zinc, varnish and other materials used in painting and hard oil finishing, shall be delivered at the building in original packages, seals unbroken, bearing the brand and name of the manufacturer.

85. PRICE: (a) The Power House will be paid for at the price bid, in the proposal, for that item. The price bid will include all labor and materials necessary to complete it as described in Sections 55 to 84, inclusive, of these specifications.

(b) The Piles, Excavation, Concrete Foundation, and Equipment, will be paid for at the price bid for those items.

POWER HOUSE EQUIPMENT.

86. CAPACITY OF MACHINERY: (a) The capacity of the Power House shall be such that provision shall be made for generating the energy required for a total of twenty-six hundred and twenty-seven arc lamps for lighting the streets, parks and other public places, twenty-five (25) arc lamps for illuminating the Generating Station, and for incandescent lighting service in the following public buildings:

City Hall Building.....700, 16 c. p.
New Court House and Jail.....900, 16 c. p.
House of Detention .....250, 16 c. p.
Civil District and Supreme Courts..400, 16 c. p.
Public Lighting Station .....200, 16 c. p.

(b) The entire system from the lamps back to the boiler furnaces, shall be capable of generating and transmitting the stipulated energy without overloading or forcing any part.

(c) The efficiencies of the several parts of the system from the furnaces to the lamps, shall be stated and guaranteed by bidders, and in adjudicating a contract as much consideration will be given to economy of operation due to these efficiencies as to the economy in first cost.

(d) On account of the power factor of such a system being less than unity, the generators shall develop, without overload, the wattless current in addition to the energy required by the entire system.

87. GENERATORS: (a) There shall be erected where shown on the plans, in the Office of the City Engineer, four (4) Alternating Current Generators. The generators shall be uniform in size, and any three of them shall be capable of delivering the energy required by the entire system, leaving the fourth in reserve. There shall also be erected a fifth generator with an output capacity of 200 kilo-watts.

(b) The generators shall deliver three phase current at a potential of eleven hundred (1100) volts, and a frequency of sixty (60) cycles.

(c) The generators shall be of the revolving field type, and the revolving field piece shall be mounted on the shaft of the engine that drives it; the engine shaft shall be extended, if necessary, for that purpose.

(d) No part of the generators shall heat, when operating continuously at full power load, to a temperature of thirty-five (35) degrees Centigrade above that of the surrounding air. The generators shall also be capable of operating, after six (6) hours on full load, on an overload of twenty-five (25) per cent. for two (2) hours without dangerous heating.

(e) Each generator and engine unit shall be designed to be readily operated in parallel with all the others at the same time. The act of connecting a generator in parallel with the others, or of taking a generator out of parallel shall cause no interference with the operation of any of the other generators.

(f) The cores of the pole pieces and of the armatures shall be of the best quality, laminated sheet iron for the prevention of eddy currents. The field coils and armature windings shall be separately wound and formed, complete in themselves and

held firmly in place, but in such manner that they may be easily removed. The armature frame shall be designed to slide in a direction parallel with the shaft with planed surfaces and operating screws, in order to allow ready access to the field and armature windings.

(g) The insulation of the windings shall be of the best character, and impervious to moisture. The insulation resistance between the armature windings and frame shall be sufficient to allow a test of not less than five thousand (5000) volts alternating current, the test being made with a transformer of at least thirty (30) kilo-watt capacity. The insulation resistance between the field windings and field frame shall be sufficient to allow a test of twenty-five hundred (2500) volts alternating current.

(h) The castings for both field and armature frames shall be strong and rigid, and of ample weight and capable of withstanding all stresses with the least vibration. The castings shall be of the best quality iron, smooth, and free from blow-holes, and other defects. The unfinished parts of the castings shall be filled and rubbed to a smooth surface.

(i) The efficiency of the large generators, not including friction, shall be not less than ninety-four (94) per cent. on full load, and not less than ninety-one (91)per cent. on one-half load.

The efficiency of the small generator, not including friction, shall be not less than ninety-two (92) per cent. on full load, and not less than eighty-eight (88) per cent. on one-half load.

(j) The current for exciting the fields of the large genera-

tors shall be supplied from two (2) motor driven direct current exciters wound for the required potential. Each exciter shall be capable of supplying full load current to the fields of all four (4) large generators when operating simultaneously.

(k) A motor driven exciter for the small alternating generator shall also be provided; it shall have ample capacity to supply the necessary current for exciting the fields of that machine.

(l) All the exciters shall be compound wound, of low speed type, and of the best standard manufacture. They shall be designed and arranged to operate in parallel.

Each exciter shall be driven by an induction motor of ample size and provided with suitable starting device to obviate the necessity of excessive starting current. Induction motors shall be of best standard make, and they must be direct connected to the exciters.

(m) There shall be also installed two (2) exciters each driven by a steam engine. These two (2) exciter sets shall be of the marine type and standard manufacture. Each set shall be capable of exciting the fields of one large generator.

The sets shall be direct connected and shall be designed to operate in parallel with each other, and in parallel with the motor driven exciters.

(n) To demonstrate the capacity of the several exciters they shall be run on full rated load and in parallel for a period of ten (10) hours, at the termination of which, temperatures of all machines shall be taken. The contractor shall, at his expense, furnish all fuel, supplies and labor to make the test.

The requirements of the generators shall be proved by the tests described in Section 92 of these specifications.

(o) The bidder shall submit with his proposal a complete set of drawings of the generators and the exciter sets he proposes to install. The drawings shall show in detail the dimensions of all parts. The drawings shall be accompanied by a full description of the materials, workmanship, and finish, so as to give a complete understanding of his intention, and he shall state all guarantees of strength, durability, rating and economy.

88. SWITCH-BOARD: (a) The switch-board shall be of the most modern and complete design. It shall be built of polished marble panels not less than two (2) inches thick, and of such color and quality as the City Engineer and City Electrician will designate. The switch-board shall be erected where shown on the plans in the Office of the City Engineer; it shall be of sufficient size to accommodate all switches and instruments without crowding. The board shall be arranged so that all generators may be operated singly or in parallel.

The board shall be well lighted by incandescent lights, mounted on handsome electrolier brackets, and fitted with shades.

(b) Switches and instruments shall be the best of their kind and finished in the finest manner. The finish shall be selected by the City Engineer and City Electrician.

The scales and pointers of all instruments shall be large to render them easily observable at a distance. Illuminated dials, where practicable, shall be installed.

(c) Each generator shall have its own panel and instruments.

The instruments shall consist of an indicating watt-meter, a

recording watt-meter, an alternating current ammeter, a direct current ammeter for measuring the exciting current, fuse-blocks or other improved form of cut-outs for each conductor, concealed field-rheostats, high tension switches of the oil-break type, or others equally as good, and switch for the field current.

(d) The exciter panels and transformer panels shall be provided with the necessary high and low tension switches, alternating and direct current volt and ammeters, fuse-blocks or cut-outs for high and low tension, rheostats, etc.

(e) Each arc circuit panel may be arranged to accommodate more than one circuit provided care is taken that no panel is crowded.

(f) All other instruments or apparatus such as ground detectors, synchronizing devices, lightning arresters, etc., that may be necessary for the easy and successful operation and protection of the switch board, shall be installed and connected. The intent of these specifications is to provide a high grade switch-board complete in all parts connected and ready for use, and provided with every appliance that will add to its safety and usefulness.

(g) The bidder shall submit, with his proposal, a complete description of the switch-board and list of switches, instruments, etc., and their manufacture, that he proposes to install; also such plans, showing arrangement and connections as may be necessary to furnish a clear understanding of his intention.

(h) The conductors which connect the generators to the switch-board, and the conductors which connect the switch-board to the transformers shall have ample carrying capacity.

They shall be erected in the neatest and most workmanlike manner, and as directed by the City Engineer and City Electrician.

(i) All conductors entering the station from the street shall be protected against interference or damage by lightning by means of a sufficient number of the very best type of lightning arresters, suitably placed.

(j) Special care shall be taken in executing the provisions contained in the preceding paragraphs of this section of these specifications to arrange all conductors and electrical apparatus in such manner as to minimize injury to the operators.

89. CONSTANT CURRENT TRANSFORMERS: (a) Constant Current Transformers shall be installed for a total capacity of not less than twenty-six hundred and fifty (2650) arc lamps; the transformers shall be arranged to operate about fifty (50) lamps on each circuit.

There shall also be installed reserve transformers having a capacity for four (4) circuits of about fifty (50) arc lamps each.

The transformers will be placed, as the City Engineer and City Electrician will designate, on the steel floor at a point under the switch board; they shall be arranged so as to be easy of access for inspection, repairs or removal.

(b) Transformers shall be of the latest and most approved pattern, of high insulation and provided with the best regulating devices. They shall be equipped with every known device necessary to protect them against injury.

(c) The bidder shall submit with his proposal a complete

description of the constant current transformers and their manufacture that he proposes to install; also such plans showing arrangement and connections as may be necessary to give a clear understanding of his intention.

90. AUXILIARY MOTORS: (a) The motors for auxiliary machinery such as feed pumps, condensers, shop motors, etc., shall be preferably of the induction type, and arranged to operate at variable speed.

Each motor must be connected to the machine it drives, by means of gears, which shall be accurately fitted to operate without undue noise. The speed must be slow enough to avoid more than a single reduction. Each motor shall be provided with a recording watt-meter.

(b) The motors and transformers shall be of full size for continuous working and of the best standard manufacture.

(c) The conductors which connect the motors to the switchboard shall be erected in a neat and workmanlike manner; the switches shall be strong and well finished.

(d) Transformers for auxiliaries and for incandescent service shall be of the oil type.

91. ENGINES: (a) Each generator shall be driven by a Vertical Cross Compound Condensing Engine. Each generator shall be direct connected to its engine.

(b) The engine shall be designed to operate with a steam pressure of one hundred and fifty (150) pounds per square inch at the throttle.

(c) The normal speed of the large engines shall not exceed one hundred and ten (110) revolutions per minute, and

the speed of the small engine shall not exceed one hundred and fifty (150) revolutions per minute.

(d) Engine frames shall be heavy and possess great stiffness, in order to minimize vibration. They shall be securely bolted on the foundation with a sufficient number of foundation bolts. The bed plates shall be strong with plenty of bearing surface. All castings shall be sound, and free from blow-holes, or defects of any kind. Filling of blow-holes or other defects will not be acceptable.

(e) The engines, in all their parts, shall be made to gage, and interchangeable.

The engines shall be built to give convenient space for examination and repair of all parts, as well as ease of lubrication and adjustment.

(f) The guides and main bearings shall be made hollow for water circulation.

(g) The wearing surfaces must be of ample size, lined with Babbit Metal and so proportioned as to reduce the wear to a minimum, as well as to provide against danger from heating. The journals must be arranged to permit the nicest adjustment of parts.

(h) The packing shall be approved metallic packing.

(i) A complete system of drain pipes must be installed throughout.

(j) Each engine must be provided with a complete automatic system of lubrication, equally as good as the Siegrist System; also a complement of pipes, pumps, filters, regulators, etc. The engines must also be provided with all necessary oil guards, drip pans, etc., to avoid throwing or waste of oil.

(k) The engines must be arranged to automatically avoid speeding up in case of sudden loss of load, or other cause. The throttle valve shall be on the front of the engine and the controlling arrangement within reach from the floor.

(l) The valves of the engine shall be steam tight, and remain so even after becoming worn. They shall be easy of adjustment and work with the least friction.

(m) The cylinders, steam chests, and receivers shall be lagged with metal lagging or neat dressed and beaded walnut, or other hard wood lagging.

(n) The engines shall be erected on their foundations in a careful and workmanlike manner. All parts must be put together with the greatest precision, carefully aligned, and perfectly adjusted.

(o) Any part of any engine damaged during transportation to the Power House, or during erection or prior to acceptance shall be replaced by a new part. No patching of injured parts will be permitted.

(p) All bright work or parts with a special finish must be kept protected from rust or other injury until final acceptance.

(q) The engine castings after erection shall be thoroughly cleaned, and given three (3) coats of paint of a grade and color which the City Engineer and City Electrician will designate.

(r) Each engine shall be supplied with an approved reducing motion, permanently attached for the use of steam indicators.

(s) The engines shall be provided with a full set of gages

of the best manufacture and nickel fitted. The gages shall be placed upon neat boards, illuminated by handsome electric brackets. The piping for the gages shall be of nickeled brass and put up in a finished manner. All gages shall be fitted with suitable drain pipes.

(t) Tachometers, with permanent support and attachment, shall be connected to the end of the shaft of each engine. The tachometers shall be the best of their kind.

(u) The platforms, steps and hand-rails for handling and operating the engines, shall be made stiff to avoid vibration, and neat in finish and design; the hand-rails shall be seamless brass tubing.

(v) Each engine shall be provided with a full set of wrenches, and any and all tubes and appliances that will facilitate operation or add to the ease of adjustment or repair.

(w) The contractor shall furnish with each engine the following spare parts, and such other minor spare parts as the City Engineer and City Electrician may direct: One (1) H. P. Steam Valve, one (1) Auxiliary Valve, and one (1) Exhaust Valve; also, one (1) L. P. Steam Valve and one (1) Exhaust Valve.

(x) The power delivered to the generator shaft shall not be less than ninety-two (92) per cent. of the indicated Horse Power of the engine.

(y) The large engine shall develop an indicated horse power per hour, with a consumption of not more than fifteen (15) pounds of dry steam, at a pressure of one hundred and fifty (150) pounds per square inch at the throttle valve.

The small engine shall consume not more than sixteen (16) pounds of dry steam per indicated horse power, per hour, with a steam pressure of one hundred and fifty (150) pounds per square inch at the throttle valve.

(z) The Engine and generator units shall be designed to carry an overload of twenty-five (25) per cent. for two (2) hours with perfect safety.

(aa) All materials and workmanship of the engines, attachments and fittings shall be as good as that furnished by the best shops in the United States.

(bb) The bidder shall submit with his proposal a complete set of drawings of the engines he proposes to install. The drawings shall show in detail the dimensions of all parts. The drawings shall be accompanied by a full description of the materials, workmanship and finish, so as to give a complete understanding of the intention of the bidder, and he shall state all guarantees of strength, durability, horse power, rating and economy.

92. ENGINE AND GENERATOR TESTS: (a) Upon the completion of the Power House a test of one or more of the large engine and generator units, and a test of the smaller engine and generator units, shall be made to determine the efficiency and rated capacity of each. The tests shall be made at full rated load, which shall be artificially produced by a water rheostat.

(b) Each test shall extend over a period of ten (10) hours.

All instruments and gages shall be calibrated before and after each test.

(c) Indicator cards shall be taken at prescribed intervals from each end of each cylinder and the revolutions noted at the time of taking the card.

In calculating the consumption of water, per indicated horse power, the engine shall be charged with all the water pumped into the boilers. The power for the feed pumps shall be supplied from a separate boiler, engine and generator. Friction cards shall be taken also.

(d) In determining the generator efficiency, volt-meter, ammeter, and watt-meter readings shall be taken simultaneously with the taking of the card.

The generator shall be charged with the energy required for its fields, as shown by the reading of the instruments on the switch-board. It shall also be charged with a proportionate part of the loss in the stationary transformers and the motor driven exciters.

The general tests shall be made during the last three (3) hours of the run. Upon the completion of the run the temperature of the several parts of the generator shall be taken with mercury thermometers.

(e) Immediately upon the completion of the described test the generator and engine shall be subjected to an over-load of twenty-five (25) per cent. for two hours, at the conclusion of which, temperatures shall again be taken.

(f) The contractor shall, at his expense, furnish all fuel, supplies and labor to make the tests.

93. CONDENSERS: (a) There shall be installed, where shown on the plans in the Office of the City Engineer, three

(3) jet condensers. Each condenser shall have the capacity to condense the steam from two (2) of the large engines working at full rated load with the temperature of the injection water as high as one hundred (100) degrees Fahrenheit.

The vacuum produced and held by each condenser, shall be not less than twenty-seven (27) inches of mercury, and the piston speed must not exceed sixty (60) feet per minute.

(b) The condensers shall be designed for the use of salt water for injection.

(c) Each condenser shall be driven by an electric motor of ample capacity to operate it at full load continuously without causing the temperature of the motor to rise more than thirty-five (35) degrees Centigrade above the temperature of the surrounding air.

(d) The condensers shall be connected, as indicated on plans in the Office of the City Engineer, to the common exhaust header, and provided with valves.

(e) The condensers shall be built of the best materials, workmanship and finish. They shall be strong in all their parts, free from leaks, and simple in construction. They shall be designed to admit of ready access to the interior for examination and repair.

(f) Condensers shall be carefully erected and securely fastened to the foundation with a sufficient number of suitable bolts.

(g) Each condenser shall be provided with a suitable automatic device or valve for breaking the vacuum to prevent flooding the engines.

(h) Each condenser shall be fitted with a high grade mercury vacuum gage.

(i) A high grade thermometer shall be permanently attached to the main injection pipe.

(j) The bidder shall submit with his proposal a complete set of drawings of condensers he proposes to install. The drawings shall show in detail the dimensions of all parts. The drawings shall be accompanied by a full description of the materials, workmanship and finish, so as to give a complete understanding of the intention of the bidder. He shall state all guarantees of strength, durability, rating and economy.

94. INTAKE AND DISCHARGE PIPE LINE FOR CONDENSERS: (a) Water for condensing purposes shall be taken from the New Basin Canal. The discharge from the condensers shall be into the same canal.

An intake pipe line and a discharge pipe line shall be laid, side by side, from the Power House under Cypress Street to South Robertson Street and thence under South Robertson Street to a point near the bank of the canal at which the lines shall deflect and enter the canal forty (40) feet apart. The pipe lines shall be laid to such lines and grades as the City Engineer and City Electrician will designate.

(b) The canal and the intake pipe shall commence at a masonry lined pit, covered with a three inch by twelve inch dressed pine board lumber top, substantially framed and planed. The pit shall be constructed of the dimensions and in the manner shown on the plans in the Office of the City Engineer.

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(c) The intake pipe shall be equipped with a suitable screen at the end in the pit.

The sum of the areas of the openings in the screen shall be not less than the area of the pipe. The first length of pipe shall be planed at one end, in order that the elbow, down pipe and screen may be bolted on.

(d) The intake and discharge pipes shall be equipped with an iron body gage valve at a point near the canal. The valves shall be geared and placed so that they will open and close by means of hand wheels.

(e) The intake and discharge pipe lines shall be continued from the front of the Power House to dead ends at the rear of the Power House.

(f) Intake and discharge pipes that are buried in the ground and in masonry shall be thirty (30) inch diameter, cast iron, bell and spigot pipe. The approximate length of the sections of pipe shall be twelve (12) feet; the pipe shall be of such thickness as to stand a head of water pressure equal to approximately one hundred (100) feet.

(g) The intake and discharge pipes inside the Power House shall be thirty (30) inch, cast iron, flanged pipe, of the same lengths and thickness as the pipes laid beneath the street.

(h) A branch, flanged, cast iron pipe of suitable diameter and thickness, shall connect each condenser with the main intake and discharge pipes.

(i) The intake and discharge pipes shall be connected to each condenser.

(j) The joints of bell and spigot pipe shall be made to meet

fair, and properly centred. The joints shall first be solidly and evenly packed with hemp and then evenly leaded; the leading shall be made in one pour and caulked in a workmanlike manner.

(k) The number and size of the bolts, and the diameter and thickness of flange, shall conform to the standard adopted by the Master Steam Fitters Association.

(l) The joints of the flanged pipe shall be made with one-eighth (1-8) inch rubber gasket.

(m) The bottom of the trench in which the pipes are to be placed shall be carefully graded to the curvature of the pipe between joints to insure full bearing throughout the length of each section of pipe; under each joint there shall be laid on a transverse pecky cypress block measuring ten (10) inches wide, by six (6) inches thick by the width of the trench long.

(n) The excavation will be paid for by the cubic yard at the price bid, in the proposal, for that item. The value of the pipes and all other materials and labor employed in laying the pipe lines ready for service will be included in the price bid, in the proposal, for Power House Equipment.

95. BOILERS: (a) The boilers shall be of the Horizontal Water Tube Type. They shall be built to give easy access to all their parts for repairing and cleaning. They will be used in connection with an economizer.

(b) Each boiler shall be built for carrying a working pressure of two hundred (200) pounds per square inch, with a factor of safety of six on minimum sections. After erection and completion, they shall be subjected to a cold water pressure

test of three hundred (300) pounds per square inch, and, under this pressure, they shall be entirely water-tight.

(c) The boilers shall be provided with proper furnaces and burners of the best make for the use of crude petroleum oil as fuel.

(d) The boilers shall be six (6) in number, arranged in three batteries of two boilers each. Ample space shall be allowed around each battery, as shown on the plans in the Office of the City Engineer. Each boiler shall be arranged to operate separately from the others.

(e) The horse power of the boilers shall be three hundred and fifty (350) each, based upon an evaporation, per horse power, of thirty (30) pounds of water from a feed water temperature of one hundred (100) degrees Fahrenheit into steam at seventy (70) pounds gage pressure. Each boiler shall have not less than thirty-five hundred (3500) feet of heating surface, and shall develop its full rated capacity continuously with normal firing and without forcing.

(f) The circulation shall be free and the steam shall be dry. Calorimeter tests shall be made for the purpose of determining the dryness of the steam.

(g) The steam drums or shells shall be the best quality of steel; the tensile strength of the steel shall prove a test of not less than sixty thousand (60,000) pounds per square inch. The tubes shall be of the best manufacture. The name and manufacturer of the tubes shall be stated by the bidder in his proposal.

(h) The boilers shall be supported on steel or wrought iron frames, and not by the brick masonry walls. They shall be

set and supported to allow for expansion and contraction without injury to them, or cracking the brick masonry. The steel or wrought iron supports shall be of ample strength.

(i) The materials forming the boilers shall be of ample strength and of the best quality of the several kinds. The workmanship must be equal to that turned out by the best boiler factories in the United States.

(j) The brick masonry shall be carried up from the concrete foundation and shall be formed of ordinary, well burned, building brick, thoroughly wetted before being laid. Each course shall be laid straight and joints well shoved, filled and flushed solid. The mortar shall be formed of four (4) parts sharp sand and one (1) part first quality lime.

The sides and back of the boiler walls shall be faced with pressed brick of good quality and uniform color. The side and rear walls shall contain a one (1) inch, tight made, air space. The fronts of the boilers shall be faced with enameled brick, as the City Engineer and City Electrician will direct.

The inside of the boiler furnaces shall be lined with first-class, hard burned, American fire-brick, laid in the best quality of ground fire clay with thin joints.

(k) Each boiler shall be provided with a first-class rising spindle steam stop valve; also a safety valve of the pop type, of the best manufacture. Safety valves shall be piped to the outside of the building, as directed.

(l) The water feed piping of the boilers shall be brass where exposed to view. The feed pipes to each boiler shall be equipped with a permanently attached and protected thermometer.

(m) The steam gages shall be not less than fifteen (15) inches in diameter, in nickeled cases, and the divisions of scale shall not be more than five (5) pounds and clearly numbered so as to be easily observable at a distance.

A draft gage and pyrometer of best manufacture shall be attached to the breeching near the chimney, and a pyrometer shall be attached to the breeching where the gases enter the economizer.

All piping to gages shall be of brass; all pipes and gages shall be arranged to be drained, where necessary, to prevent injury from freezing.

(n) Blow-off cocks and valves, and all other valves necessary for the proper operation of the boilers, shall be installed and connected. The feed water valves shall be placed so as to be operated from the front of the boilers.

(o) The boilers shall be equipped with every attachment and appliance used on boilers of the best modern type, including water columns, gage glasses, gage cocks with brass drain pipes, tube scrapers, tube expanders, steam sweepers, and six-ply, one and one-half (1 1-2) inch, steam hose with necessary steam connection and valves at each boiler, and all tools and wrenches for all nuts and fittings. All equipment, attachments, appliances and tools shall be of the best manufacture.

(p) Boiler fronts shall be of ornamental pattern, and designed to give the proper regulation of air and to prevent radiation of heat. The dampers shall be arranged for easy operation and so that they may be set in any position from the floor.

(q) The City of New Orleans reserves the right to demand such specimens of the materials entering into the construction of the boilers as may be required for testing; the specimens shall be furnished by the contractor, as the City Engineer and City Electrician demand, at any time during the progress of the work.

(r) The boilers shall be equipped with a blow-off pipe of suitable size. Heavy cast iron flanged pipe shall be laid in the ground and in masonry; elsewhere the pipe may be lap welded.

(s) The main line of the boiler blow-off shall be placed under the steel floor in the rear of the boilers, with suitable connections to each boiler.

(t) The main blow-off shall discharge into a cooling pit situated in the Power House Yard abreast of the boiler room. The pit shall be lined with a brick masonry wall about thirteen (13) inches in thickness, and the masonry shall be surfaced on the inside with pure cement mortar. The pit may be either circular or square in shape, about seven (7) feet deep and cross-sectional area of about fifteen (15) square feet. The pit shall be covered with a heavy cast iron grating.

The pit shall be drained by an overflow tile pipe into the nearest street gutter.

(u) A two and one-half (2 1-2) inch cast iron water pipe shall be laid from the four (4) inch water main in the boiler room to connect with the cooling pit. This pipe shall be equipped with a two and one-half (2 1-2) inch gate valve situated in the boiler room.

(v) After erection, the boilers shall be thoroughly cleaned and painted in such manner as may be designated by the City Engineer and City Electrician.

(w) The bidder shall submit with his proposal complete detail drawings together with a complete description of the boilers he proposes to install. The description shall furnish the sizes of the several parts of the boilers, the quality and make of the materials, the guarantees of evaporation, horse power rating, heating surface, efficiency using Beaumont Crude Oil for fuel, and a full list of the appliances, attachments and tools that he proposes to furnish with each boiler, so as to give a complete understanding of the intention of the bidder.

(x) Upon the completion of the Power House, tests of one or more boilers shall be made by the contractor under the direction of the City Engineer and City Electrician to determine the rated capacity and the efficiency of the boilers, and the quality of the steam generated by them.

The contractor shall furnish all special instruments and appliances that may be required for making the tests, and all instruments and gages shall be calibrated by comparison with standard instruments before and after each test. The cost of the calibration shall be borne by the contractor, and he shall further furnish at his expense all fuel, supplies and labor required to make the tests.

(y) The method to be pursued in making boiler tests shall be in accordance with the latest Code of the American Society of Mechanical Engineers. Each test shall extend over a period of not less than ten (10) hours.

96. FUEL OIL SYSTEM: (a) The boiler furnaces shall be designed and equipped for the use of Beaumont Crude Oil for fuel. They shall be equipped with a complete system of oil burning apparatus of the most approved type, which shall be capable of generating steam with greatest economy.

(b) The oil burning apparatus shall also include a complete system for supplying oil to the furnaces.

(c) Suitable fuel oil heaters shall be installed in order that a uniform density of the oil may be maintained under a difference of atmospheric temperatures.

(d) There shall be installed two (2) steam driven fuel Oil Feed Pumps, each of which shall be of such size and capacity as will simultaneously supply the fuel oil for all the boilers when working at their full rated load.

(e) The suction of each pump shall be connected with the oil storage tanks, and the discharge shall be connected with the oil burners in each boiler furnace.

(f) A meter of the Piston reciprocating pattern, durable and of simple construction shall be installed in each discharge pipe.

(g) The feed systems shall be in duplicate; each system shall be entirely independent of the other.

(h) High grade stop valves shall be placed in the pipe line at such locations as the City Engineer and City Electrician may direct.

(i) The installation of the pumps and pipe line shall be of the highest grade of material and workmanship; every appliance that will add to the safety of the system shall be employed.

(j) The bidder shall furnish a complete description, with such drawings as may be necessary, to give a clear understanding of the system he proposes to install.

97. ECONOMIZER: (a) An economizer, in complete working order, shall be installed in the boiler section of the building where shown on the plans in the Office of the City Engineer. The Economizer shall have a capacity of twenty-one hundred (2100) boiler horse power. The tubes shall be arranged to permit ready access to them at all points for cleaning and repairs. Special means shall be provided for cleaning tubes. The tubes shall be made to safely stand a cold water pressure of four hundred (400) pounds to the square inch. All materials entering into the construction of the economizer shall be of the best manufacture of their kinds.

(b) The bidder shall submit with his proposal complete plans showing in detail the sizes and number of tubes, their inside and outside diameter, and their arrangement. He shall also submit a detail description of the economizer which shall carefully specify the quality of all materials, the number of valves, the method of making joints, and any and all information that will give a clear and full understanding of his intention.

98. BOILER, ECONOMIZER AND CHIMNEY CONNECTIONS: (a) The general arrangement shall be such that the hot gases shall pass from the boilers through the economizer to the chimney. There shall also be a by-pass properly arranged with damper so that the gases from any or all boilers may be delivered either to the chimney or through

the economizer to the chimney. Each flue connection from the boilers to the main breeching shall be provided with a damper.

(b) General detail plans showing description and construction of the boiler, economizer and chimney construction shall be submitted by the contractor to the City Engineer and City Electrician, and be approved by them.

(c) If, for the proper and economical operation of the boilers, furnaces, and economizers, artificial draft should be required, there shall be installed suitable steam driven fans, in duplicate, for inducing draft. Each fan shall be of sufficient size to serve all the boilers when operating on full rated load.

99. CHIMNEY: (a) A chimney of the self-sustaining type shall be erected where shown on plans in the Office of the City Engineer. It shall be of such area and height as the requirements of the oil-burning apparatus and furnaces render necessary for their proper operation.

(b) The chimney shall be built of heavy steel plates and rings, and the lower portions shall be tapered as indicated on plans referred to.

(c) The chimney shall rest upon and be secured to a steel frame of ample strength to support it and render it stable against wind pressure. The steel supporting frame shall be anchored solidly to the "I" beams embedded in the concrete, and placed there for that purpose.

(d) General detail plans for the construction of the chimney and supporting frame shall be submitted by the contractor to the City Engineer and City Electrician, and be approved by them.

100. BOILER FEED PIPE: (a) The piping for the boiler feeders shall consist of a duplicate set of pipes throughout, all of full size and so arranged and connected that no accident to any pipe shall cause interference with the feeding of the boilers.

(b) The feed piping shall be connected to the boiler feed pumps, the economizer, and the boiler, in the most thorough and complete manner.

(c) The pipes and fittings for the steam system shall be of iron, the kind known as extra strong lap welded, except where exposed to view on boiler fronts, where they shall be of polished brass.

(d) Each branch pipe to the boilers shall be equipped with a brass body globe valve for regulating the water supply to the boilers, and also a brass body check valve; the regulating valves must be placed at the front of the boilers.

(e) A check valve and a gate valve shall be placed in each pipe connecting the feed pumps with the main pipes.

(f) No more than two (2) lengths of pipe shall be put together without flange unions; flange unions shall also be used for couplings wherever necessary to permit the easy removal of any of the piping.

(g) All main feed pipes shall have an inside diameter of six (6) inches.

(h) Pipe bends or long radius elbows shall be used throughout on the feed pipe system, except where otherwise designated by the City Engineer and City Electrician.

(i) The feed pipe system shall be subjected to a hydraulic

pressure test of three hundred (300) pounds per square inch, and under this pressure the joints and valves shall not leak.

(j) The feed pipes shall be properly supported and erected in a thoroughly neat and workmanlike manner.

(k) A water meter shall be installed in each main feed pipe near the pumps.

(l) The meters shall be the Piston reciprocating pattern, and of the best workmanship and material.

101. BOILER AND PUMPS: (a) There shall be installed four (4) boiler feed pumps. Three (3) pumps shall each have capacity to supply with ease feed water to the entire boiler installation when the boilers are working at their full rated load. The fourth pump shall have capacity to supply one boiler at its full rated load.

(b) Two of the large pumps described in paragraph (a) shall be of the vertical plunger pattern, and each shall be driven by an electric motor.

(c) One of the large pumps described in paragraph (a) shall be of the horizontal duplex pattern, and shall be steam driven.

(e) All plungers of feed pumps shall be outside packed.

(f) The water end of all feed pumps shall be of composition metal.

(g) All feed pumps shall be designed to work against a pressure of two hundred and fifty (250) pounds to the square inch, the boiler pressure for the steam driven feed pumps being one hundred and fifty (150) pounds per square inch.

(h) The feed pumps shall be simple in design, and all parts shall be readily accessible for inspection and repair.

(i) The materials and workmanship shall be of the best.

(j) All feed pumps shall have their suctions arranged separately to receive water from both the artesian well and the yard water main.

(k) A gage valve shall be placed in the suction and discharge pipes of each pump.

(l) A high grade full sized relief valve, designed for accurate adjustment, shall be placed in the discharge pipe of each pump.

The bidder shall submit with his proposal complete detail drawings and a complete description of the pumps he proposes to install. The description shall give the sizes of the several parts of the pumps, capacity of each, quality of materials, and the name of the manufacturer.

102. ARTESIAN WELL: (a) An artesian well of such depth as may be necessary to land same in an adequate water stratum shall be installed; the location of the well shall be in the yard on the boiler side of the Power House.

(b) The pipe and fittings used shall be standard, of the best manufacture, and all connecting joints shall be made in a workmanlike manner.

(c) The strainer shall be as large in diameter as the well pipe will allow, and it shall be of such length as practice has demonstrated to be best for wells of this character.

(d) The full length of the strainer shall be landed intact in the water stratum without being torn; it shall be so designed as not to choke with sand or other matter.

(e) The capacity of the well when pumped by a suitable air compressor shall be not less than two hundred (200) gallons per minute.

(f) A heavy sheet iron storage tank, with a storage capacity of not less than three thousand (3000) gallons, shall be erected in the fire room, at such elevation and location as may be directed by the City Engineer and City Electrician, into which the discharge from the well shall be piped with suitable connections. The tank shall be equipped with a suitable overflow pipe connected with the nearest yard drain.

(g) The air compressor shall be of the best manufacture and design. The compressor shall be steam driven, and may be either the vertical or horizontal type; it must be of such size as to deliver the full capacity of the well, with a piston speed of not more than seventy-five (75) feet per minute.

103. STEAM AND EXHAUST PIPE SYSTEMS: (a) The materials and workmanship entering into the pipe systems must be first-class in every detail. The general arrangement of steam and exhaust pipes are shown on the plans in the Office of the City Engineer.

(b) Flanges, flanged fittings, and valves shall have their holes drilled in multiple of four, the holes to straddle the centre line, so that any fitting or valve may be made to face any quarter.

(c) The diameter and thickness, and the number and size of bolts, for all flanges and flanged fittings shall conform with the rules for such work adopted by the Master Steam Fitters Association. All bolt holes shall be true to the centre of the bolt circle and at right angle to the face of the flange or fitting.

(d) Under no circumstances where the bolt holes fail to come fair on any connecting flange or fitting will chipping or reaming be allowed to admit bolts.

(e) The faces of all flanges on cast steel or cast iron pipe shall be turned true and parallel; the back face of the flanges shall be either counter-sunk or have the boss faced at the bolt holes, as may be necessary to make a true or uniform bearing under the heads of the bolts or nuts.

(f) The threads on all screwed pipes and fittings must be clean cut, true and to gage. The threads on all pipes and fittings must be thoroughly cleaned of all dirt or grit before they are connected. They must screw together without undue friction.

(g) All steam pipe flanges, six (6) inches and larger, shall be rolled steel and the pipe turned over and peened; gaskets shall be corrugated copper.

(h) All steam pipe, six (6) inches and larger, except the steam header, shall be extra strong, lap welded iron pipe.

(i) All steam pipe flanges, two (2) inches to four (4) inches diameter, inclusive, shall be extra heavy; gaskets shall be composition sheet gum.

(j) All steam pipe, two (2) inches to four (4) inches diameter, inclusive, shall be extra strong, lap welded, iron pipe.

(k) All exhaust pipes and their flanges and fittings shall be standard weight, lap welded, iron pipe.

(l) The face of all flanged fittings shall be drawn up evenly in order that they may meet fair, and not compress the gasket more in one place than in another.

(m) The main steam header shall be of the best quality, close grained, cast steel flanged pipe, free from blow-holes or other defects.

(n) The joints of main steam header shall be made with corrugated copper gaskets.

(o) All bends shall be long radius and extra heavy.

(p) The risers from steam headers and from the belt steam line to connect to the throttles of engines, shall be extra heavy, lap welded pipe.

(q) The pipe for exhaust to atmosphere shall be standard, lap welded, iron pipe, with standard flanged fittings and equipped with approved relief valves.

(r) An approved exhaust head, equipped with proper drain pipes and connections, shall be placed on the top of each atmospheric pipe.

(s) The steam pipes and steam headers shall be of such size that when all engines are running on full load the fall of pressure from the boilers to any engine throttle shall not exceed five (5) pounds.

(t) A cold water pressure test of two hundred (200) pounds per square inch shall be applied to the steam piping after erection and before the pipe covering is put on, and under this pressure all joints and valves shall be tight.

104. PIPE COVERING: (a) All pipes and surfaces that may radiate heat shall be covered with a first-class covering acceptable to the City Engineer and City Electrician.

(b) The material used in the covering shall be durable, fireproof, and a non-conductor of heat.

(c) The covering material shall be sectional and of s shapes that it can be easily removed and replaced.

(d) The covering shall be put on in a workmanlike mai with canvass jacket, the lap of which shall be pasted and n banded; the canvass jacket shall be given two coats best qu white lead paint.

105. SEPARATORS: In each branch steam pipe to e engine there shall be installed a first-class steam separa suitably connected and drained.

106. STEAM DRAINS: (a) There shall be instal complete, the Holly Gravity Return System, or other equ as good, for high pressure steam drains.

(b) All other parts of the steam machinery and piping s be drained in a thorough manner; first class traps shal placed wherever required as directed by the City Engineer City Electrician.

107. VALVES: (a) All valves shall be of first-c manufacture, and of a design that shall first be approved the City Engineer and City Electrician.

(b) Valves larger than three (3) inches shall be flan They may have cast iron bodies, but the gates and seats n be of composition metal. They shall be of the bolted bor type.

(c) Valves smaller than three (3) inches shall be made tirely of composition metal; they may have screw ends.

(d) Valves three (3) inches or larger shall be gate va with rising spindles and reversible seat rings.

(e) All valves subject to pressures exceeding one hundred (100) pounds per square inch shall be extra heavy.

(f) All valves larger than four (4) inches shall be equipped with by-passes.

108. AUXILIARY PUMP AND FIRE SYSTEM: (a) One (1) steam driven fire pump shall be installed in the Power House to be located in the boiler room section of the building near the boiler feed pumps. The discharge of this pump shall be connected to the fire hydrant system in the building and yard; its suction shall be connected to the yard water main.

(b) The pump shall be of the Duplex Plunger pattern. It shall have a capacity of not less than five hundred (500) gallons per minute; the piston speed of each plunger shall not exceed one hundred (100) feet per minute. The pump shall be capable of operating against a pressure of one hundred (100) pounds per square inch.

(c) The pipe line of the fire system in the Power House shall be a belt; no dead ends will be allowed within the Power House. The pipe line shall be installed under the steel floor in the engine and boiler rooms.

(d) In addition to being connected to the fire pump, the fire pipe line shall be connected to the yard water mains; the arrangement and connections shall be such that there shall always exist a water supply, at the pressure of the city water-works system, for fire purposes.

(e) The fire system shall be standard belt pipes, lap welded, iron pipe, not less than four (4) inches inside diameter.

(f) The fittings shall be flanged; gaskets shall be sheet gum.

(g) The risers from the mains to the openings for hose connections in the boiler room shall be two and one-half (2 1-2) inches, lap welded, standard iron pipes.

(h) The risers from the main to the openings for the hose connections in the engine room shall be two and one-half (2 1-2) inches, standard, lap welded, iron pipe; the exposed sections in the engine room shall be polished brass.

(i) There shall be placed in the engine room six (6) hydrants or openings; three (3) hydrants of which shall be placed against the wall on each side of the room.

There shall be placed in the boiler room three hydrants or openings; they shall be placed against the side wall of the building.

Each hydrant or opening shall be equipped with a brass body gate valve of the Quick Opening Type.

(j) There shall also be installed in the belt line as the City Engineer and City Electrician may direct, between the specified valves, such additional valves that a section of the pipe line may be removed for repairs or other causes, without crippling the entire system.

(k) There shall be installed in the discharge line, at the pump, a suitable relief valve, and a six (6) inch dial pressure gage, range O to two hundred (200) pounds.

(l) There shall be placed at each hydrant or opening, fifty (50) feet of two and one-half (2 1-2) inch Cottom Mill hose; one swinging hose reel or rack; and one brass nozzle with three-quarter (3-4) inch opening.

(m) There shall be installed, in an acceptable manner, at points in and about the Generating Station, that the City Engineer and City Electrician will designate, twenty (20) portable chemical fire extinguishers of about three (3) gallons capacity each.

109. CRANE: (a) A traveling crane shall be installed as shown on the plans in the Office of the City Engineer. It shall have a safe carrying capacity of not less than fifteen (15) tons, and a lift of thirty (30) feet. The bridge shall be built of steel. The crane shall possess great stiffness when carrying the maximum weight. The bridge girders shall project over the rails. The wheels shall be double flanged. The axle bearings shall be provided with suitable grease boxes.

(b) The crane shall be operated by three (3) electric motors; first, for moving the crane on its rails; second, for moving the carriage on the bridge; third, for lifting weights. All the motors shall be provided with controllers, switches, and reversing mechanism, placed in a suspended car so as to permit the operation of the entire crane by one man stationed in the car. The crane shall be thoroughly and well built, strong, and capable of doing heavy and rough work.

(c) The motors shall be ample in size and of the best standard make. The crane shall be wired up, and connected by a trolley wire to the switch board in the best and easiest manner. The speed at full load at which the crane shall operate shall be less than the following:

Speed of whole crane along tracks..... 30 ft. per min.
Speed of carriage along bridge..... 30 ft. per min.
Lifting or lowering maximum weight..... 5 ft. per min.

The bidder shall furnish with his proposal a complete description and plans of the crane he proposes to install.

110. AIR SYSTEM: (a) There shall be installed a compressed air system consisting of an air compressor, air storage tanks, and piping, for the purpose of cleaning such parts of the machinery as are not readily accessible.

(b) The air compressor shall be of first-class manufacture, and shall be large enough to thoroughly perform the work required of it.

The compressors shall be connected to and operated by a suitable electric motor; they shall be connected to a system of pipes with the outlets at such points in the Power House and the Office and Stable Buildings as may be designated by the City Engineer and City Electrician. Each outlet shall be equipped with a valve and an adequate length of hose and nozzle. One outlet shall be located in the lamp repair room in the Office and Stable Building.

111. LUBRICATING OIL STORAGE TANKS AND FILTERS: (a) There shall be installed in the Power House, where the City Engineer and City Electrician will designate, two (2) iron tanks for storage lubricating oil. Each tank shall have a storage capacity of one hundred (100) gallons. The storage tanks shall be provided with suitable faucets, drip pans, etc., and piping, to enable the oil to be pumped from barrels in the basement to the tanks. The tanks shall be substantially built and of neat appearance; they shall be equipped with suitable dust proof covers.

(b) There shall be installed two (2) oil filters, each hav-

ing capacity to filter not less than twenty-five (25) gallons of oil in twenty-four (24) hours. They shall be designed to thoroughly filter the oil and all parts shall be easy of access for cleaning and repair.

112. TELEPHONE AND FIRE SIGNAL: (a) There shall be installed a complete local telephone system that will connect the Power House, the Office and Stable Building and the Store Yard.

(b) The number of telephone stations shall be ten (10). Each telephone shall have a switch-board, so arranged that communication can be had with any telephone on the system.

(c) The signal bells in the engine and fire room of the Power House shall be of such size as to be readily heard above the noises in these locations.

(d) There shall be installed a first-class signal system of twenty-four (24) stations or call boxes erected in such locations as the City Engineer and City Electrician will designate.

(e) A high grade indicating alarm gongs shall be installed in the engine room, in the boiler rooms, in the basement of the Power House, in the upper and lower floors of the Office and Stable Building, and in the Store Yard.

113. WORK SHOP: (a) There shall be arranged and equipped in the Power House, a repair shop for the purpose of making ordinary repairs.

(b) The power driven equipment shall consist of one engine lathe, pipe threading and cutting machine, emery wheel tool grinder, grind stone, and drill press; all of which shall be driven from shafting operated by an electric motor.

(c) The shafting for operating the engine driven equipment shall be of adequate size and erected in a workmanlike manner. The pillow blocks, ceiling and floor hangers shall be of self-oiling pattern; couplings shall be flanged and key seated.

(d) The lathe to be installed shall be engine driven, with friction counter-shaft.

(e) The lathe shall be hollow spindle, with bronze bearings, the swing over rest not less than fourteen (14) inches, and the distance between centres about five feet. It shall be screw cutting with change gears to cut threads one to eighteen inches and fitted with feed rod gears.

(f) There shall be furnished with the lathe, one centre rest, large and small face plates, two centres to conform to the Morse taper; and, a chuck for small drills, one ten inch four jaw, reversible chuck, and a full set of wrenches.

(g) There shall be installed one combined wheel and lever feed drill press, complete with counter-shaft and cone shaft for four (4) speeds, capable of swinging twenty inches; the whole in spindle Morse taper.

(h) There shall be installed one pipe threading and cutting machine with counter-shaft and attachments, to cut pipe threads one to four inches. There shall be furnished with it three sets of right-hand thread chasers.

(i) There shall be installed one single emery wheel tool grinder, with counter-shaft, complete; the emery wheel will be about fourteen inches in diameter, two inch face.

(j) There shall be installed one belt driven, thirty (30) inch

by four (4), grindstone, with iron frame and stand, complete.

(k) There shall be installed one portable blacksmith forge, complete, with fan and hand lever; the size of the hearth will be about twenty-seven (27) inches by twenty-one (21) inches.

(l) There shall be furnished the following list of implements and tools, all of which shall be the best of their kind:

(m) One set, Oster, adjustable stock and dies to cut pipe threads one-eighth inch to one-half inch.

(n) One set, Oster, adjustable stock and dies to cut pipe threads one-half inch to three and one-half inches.

(o) One extra set of dies with each of the foregoing described stocks.

(p) One, tap for 1-8, 1-4, 1-2, 3-4, 1, 1 1-4, 1 1-2, 2, 2 1-2, 3, 3 1-2, and 4 inch pipe; all right-hand threads, and one, reamer for each of the above sizes.

(q) Tap and reamer wrenches for the above size taps and reamers.

(r) One, hinged vise for 1-8 to 2 inch pipe and 2 to 4 inch pipe.

(s) One, cutter for 1-8 to 1 inch, 1 to 2 inch, 2 to 3 inch, and 2 1-2 to 4 inch pipe.

(t) Two, of each size chain pipe tongs for 1-8 to 3-4 inch, 1-4 to 2 1-2 inch, and 2 to 6 inch pipe.

(u) Two, of each size trimo wrenches 6, 8, 10, 14, and 18 inches.

(v) Six, of each size knife handle monkey wrenches 4, 6, 8, 10, 12, 18 and 21 inches.

(w) Three, of each size single head drop forged engineers' wrenches for standard nuts 1-8 to 2 inches, advancing by 1-16 inch.

(x) Two stocks with dies, taps and tap wrenches to cut standard 1-4 to 1-2 machine threads.

(y) One, 10, 15 and 24 inch ratchet drills, with sockets for square and Morse taper shank drills.

(z) Twenty-four lathe turning tools, selected.

(aa) One set of heavy steel lathe dogs 1-4 to 5 inches inclusive.

(bb) Two, four ton hydraulic jacks, lift twelve inches.

(cc) One, six ton hydraulic jack, lift twelve inches.

(dd) Four, of each size, locomotive jack screws: 1 1-2 x 8, 2 x 12, 2 x 6, 2 1-2 x 8 inches.

(ee) One-half doz., No. 5 Scoop shovels.

(ff) One-half doz., long handle, round point, shovels.

(gg) One-half doz., long handle spades.

(hh) Six, iron frame and iron tray wheelbarrows.

(ii) One, wagon trunk platform three (3) feet by four (4) feet.

(jj) One, heavy freight trunk.

(kk) One, light freight trunk.

(ll) One-half doz., each ball, straight and cross pein machinist hammers, of assorted weights.

(mm) One-quarter doz. of each, blacksmiths' sledges, cross and straight pein and double face, assorted weights.

(nn) One hundred pounds steel blacksmiths' tools, assorted shapes.

(oo) Twenty (20) pounds steel cold chisels.

(pp) Three doz., assorted steel, cape, round nose and diamond point chisels.

(qq) One-half doz., blacksmiths' tongs, round and flat nose.

(rr) One, small bench anvil, about twenty pounds.

(ss) One, large anvil, about one hundred and fifty pounds.

(tt) Two, washer or gasket cutters.

(uu) Two of each, twist drills 1-8 to 1 1-2 inch in size advancing by 1-32 of an inch. Morse taper shank.

(ww) One-half doz., 2 1-2 x 5 foot handle cant hooks.

(xx) Six, double patent roller wooden tackle blocks for one inch diameter rope.

(yy) Six, single patent roller wooden tackle blocks for one inch diameter rope.

(zz) Three of each size, single and double, patent roller wooden tackle blocks, for one-half inch diameter rope.

(aaa) 750 feet, H. L. Manilla rope, one inch in diameter.

(bbb) 750 feet, H. L. Manilla rope, one-half inch in diameter.

(ccc) One-half doz., adjustable hack saw frames.

(ddd) Six doz., hack saw blades.

(eee) Six, ratchet braces, twelve inches sweep.

(fff) One, breast drill.

(ggg) Three of each size, 1-4 to 1, advancing by 1-16, wood bitts.

(hhh) Two, solid box leg vises, five inch jaw.

(iii) One, parallel bench vise, six inch jaw.

(jjj) Three, parallel bench vise 3¼ inch jaw.

(kkk) Six, gasoline torches.

(lll) Fifty pounds, assorted soldering irons.

(mmm) Three doz., assorted engine oil cans.

(nnn) One, counter platform (with brass scoop) scale to weigh up to two hundred pounds.

(ooo) One, portable platform scale with drop lever, capacity three thousand (3000) pounds; platform 30" x 30".

(ppp) Six, wedge point crow bars.

(qqq) Six, pinch point crow bars.

(rrr) One doz., twenty-seven inch railroad picks.

(sss) Three doz., pick handles.

(ttt) One doz., axes.

(uuu) One doz., hand axes.

(vvv) One doz., carpenter hatchets.

(www) One-half doz., claw hammers.

(xxx) One, micrometer surface gage.

(yyy) Two, gage glass cutters.

(zzz) Two hundred feet, one inch, inside diameter, six-ply steam hose.

(aaaa) Two chain blocks, capacity of three thousand (3000) pounds each.

(bbbb) Fifty extra reserve arc lamps, of the same type as the lamps installed in the street system.

(cccc) 250 inner and 250 outer lamp globes.

(dddd) There shall also be furnished one (1) fire-proof box with hinged cover, hasp fastening and padlock, to hold one hundred pounds of waste; this may be built of sheet iron,

or wood, covered inside and out with galvanized iron or zinc. The box shall be fitted with iron handles and swivel rollers.

114. RECORDING AND TESTING INSTRUMENTS: There shall be installed two Edison's Steam Recording gages, range O to 250 pounds; one of these gages shall be located at the switch-board in the Power House, and the other shall be at such location in the Power House as may be directed by the City Engineer and City Electrician.

Two, A. C. portable volt meters, range 0 to 150 volts.

Two, D. C. portable volt meters with double scale 0 to 150 volts and 0 to 300 volts.

One, A. C. portable ammeter, range 0 to 150 amperes.

One, A. C. portable ammeter, range 0 to 25 amperes.

One, D. C. portable ammeter, range 0 to 150 amperes.

One, D. C. portable ammeter, range 0 to 25 amperes.

One, high grade separating calorimeter, with condensing vessel, with one hundred feet of one-half inch, four-ply steam hose.

One, high grade portable tachometer, with scales and three speeds.

One, hydraulic pump, with high grade test gage for testing gages.

One, recording portable watchman's clock, and installation for twenty-four key stations.

Four, high grade steam engine indicators, with assortment of springs, as selected.

One, high grade polar planimeter.

Six, full jeweled, high grade wall clocks, diameter of face not less than fifteen (15) inches.

115. LIGHTING: (a) The power House shall be lighted by both arc and incandescent lamps.

(b) Six (6) arc lamps shall be installed in the engine room, and six (6) arc lamps shall be installed in the boiler room. Two (2) arc lamps shall be installed on the front of the building suspended from ornamental brackets securely fastened to the wall. The lamps shall be hung, wired and connected as directed.

(c) The value of the above lamps will be included in the price bid, in the proposal, for the Power House Equipment.

Such other lamps as may be necessary to light the Generating Station Grounds will be designated by the City Engineer and City Electrician. Such lamps will be paid for separately at the prices bid, in the proposal, for the several items forming a complete lamp ready for service.

(d) Such number of incandescent lamps as may be necessary to brilliantly illuminate the entire Power House, shall be installed. Where directed, the incandescent lamps shall be placed upon neat brackets or electrolier fixtures.

(e) The wiring for arc and incandescent lamps shall be installed in accordance with the best practices of the day. Everything necessary to the complete installation shall be furnished.

(f) The wires shall be covered with high grade rubber and braided insulation.

(g) The wires shall have ample carrying capacity.

(h) Branch cut-outs shall be placed in cabinets, placed where they may be readily accessible.

(i) Each arc lamp shall be controlled by a switch, suitably placed.

(j) Wiring for incandescent lamps placed on the engines shall be laid in steel armored conduits.

116. GUARANTEE: (a) The equipment shall be first-class in every particular, and complete in every detail, whether specified herein or not, and the entire system shall be guaranteed by the contractor against all defects of material, or of bad workmanship for a period of one (1) year from the date of the acceptance of the system; and, he shall repair or replace, without delay, all defective apparatus to the satisfaction of the City Engineer and City Electrician.

(b) Should the contractor fail after proper notice has been served on him by the City Engineer and City Electrician, and the lapse of a reasonable time thereafter, to replace or repair such part or parts of the Power House Equipment as have proven defective or badly constructed, the City Engineer and the City Electrician shall notify the Mayor and the City Council.

(c) Under the circumstances the City Council shall place the contractor in default and make formal demand on the bondsmen who have furnished the bond provided for in paragraph (b) of Section 13 of these specifications. Should the bondsmen fail to promptly comply with the requirements of paragraph (a) of this section, the City Council shall then formally place the bondsmen in default and proceed to make the necessary repairs as it may elect.

117. PRICE: The Power House Equipment will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to complete the equipment as described in Sections 86 to 116, inclusive, of these specifications.

OFFIOE AND STABLE BUILDING.

118. EXCAVATION: (a) Such excavation as may be necessary to properly lay the sub-grade plank floor and the brick wall footings shall be made. It is estimated that the excavation for the main walls will extend not more than forty-two (42) inches, and the excavation for the division walls will extend not more than twenty-four (24) inches, below the present ground surface.

(b) Excavation will be paid for, by the cubic yard, at the price bid, in the proposal, for that item.

The price bid will include the work of excavating, refilling and tamping, and removing surplus earth from the premises.

(c) The contractor shall be careful not to make excavations of greater dimensions than the City Engineer and City Electrician prescribe; should he excavate to a greater extent than the City Engineer and City Electrician have designated, he shall receive no compensation for the excess excavation.

(d) The contractor shall be responsible for sloughing, and he shall, at his expense, take such steps as may be necessary to provide against sloughing; no compensation will be allowed for removing earth that has sloughed into the pit, or for refilling and tamping the cavities so created.

(e) The contractor shall, at his expense, do such pumping as may be necessary to keep the trenches free of water, so that the excavation may be completed and the plank floor and wall footings satisfactorily placed.

119. SUB-GRADE PLANK FLOOR: Sub-grade plank floor shall consist of two (2) tiers of sound, pecky cypress boards; the boards shall measure two (2) inches thick, about twelve (12) inches wide, and of such length as will extend six (6) inches outside each side of the wall footings. The tiers shall be laid cross-wise, and the second shall be spiked to the first with four (4) inch spikes.

120. FOOTINGS: Wall footings shall be built of brick masonry with two and one-quarter (2¼) inch offsets. The footings under the main walls shall be seven and one-half (7½) brick wide at base, and those under the division walls shall be four (4) brick wide at base.

121. WALLS: (a) The walls shall be built of brick masonry, and of the dimensions shown on the plans in the Office of the City Engineer.

(b) Two (2) damp courses, consisting of one (1) large size whole slate each, bedded in mortar, shall extend through all walls.

112. LINTELS: Masonry over square head openings shall rest on a cast iron lintel, not less than three-quarter (3-4) inch thick, having flanges equal to the full width of the wall, and webs two (2) inches high at ends; webs shall increase in

height by one and one-half (1 1-2) inches for every twelve (12) inches the span is increased. Lintels of eighteen inches or more breadth shall be cast with double web. Where required skew-backs shall be cast on the lintels. Lintels shall bear on the wall not less than eight (8) inches at each end.

123. WALL ANCHORS. Walls shall be thoroughly bonded at points of contact. Side walls shall be tied to end walls, and division walls shall be tied to side walls, at intervals of four (4) feet in height with wrought iron anchors, measuring two and one-half (2 1-2) inches by three-eighths (3-8) inch and extending not less than two (2) feet six (6) inches in both directions; each end shall be split, one turned up and the other turned down.

124. PRESSED BRICK FACING. (a) The exterior walls of the building shall be faced with best selected and matched, Salmen Pressed Brick, with double brick arches and courses, of such color as may be designated by the City Engineer and City Electrician.

(b) Face brick shall be bonded every sixth course, eighteen (18) inches apart longitudinally, with Morse Patent Steel Wall Ties, or other equally as good, size about seven (7) inches by one-eighth (1-8) inch; all ties shall be dipped in asphaltum paint three days before being placed.

(c) Window and door frames shall be carefully and solidly bedded in the walls and sills shall be under-pinned with mortar.

(d) Pressed brick shall be laid in mortar and covered as directed with Sterling Mortar Stain; pressed brick joints shall be uniformly three-sixteenths (3-16) of an inch thick and neatly tooled.

125. CLEANING: All pressed brick surfaces shall, after completion of the building, be thoroughly cleaned and washed with a weak solution of Muriatic Acid, and given two (2) coats of raw linseed oil.

126. DOORS AND WINDOWS. (a) Full seasoned cypress "A" grade lumber under the classification adopted by the Mechanics, Dealers & Lumbermen's Exchange of New Orleans, shall be employed in making all window and door frames, doors and window sash; this wood work shall be given a priming coat of paint before being placed in position.

(b) Window and door sills shall be made of Georgia white marble and polished.

(c) Doors and windows shall be of the dimension shown on the plans in the Office of the City Engineer and of standard construction.

(d) Doors shall be solid moulded with raised panels; interior doors shall be glazed. All doors, except wagon doors, shall have glazed transoms.

(e) Wagon doors shall be extra heavy and made in two (2) sections; each section shall be arranged to roll back on a top and bottom rail with substantial iron rollers of suitable size. At the sides of each wagon door there shall be placed a substantial cast iron wheel guard.

(f) Window sash shall be checked, bored and double hung to raise and lower with Silver Lake, or other equally as good, sash cord and cast iron weights.

(g) The horse stall windows shall be fitted with a substantial iron grating anchored to the wall, and a rolling steel

blind; the steel blind shall be arranged so as to roll back on a top and bottom rail and suitable iron rollers.

127. GLAZING. (a) Windows and doors shall be glazed with "A" grade double thick American glass.

(b) Window sash shall be primed as prescribed before they are glazed, and the glass shall be bedded, tacked and puttied.

128. FRAME MEMBERS: (a) Frame members shall be long leaf yellow pine, "A" grade lumber, under the classification adopted by the Mechanics, Dealers & Lumbermen's Exchange of New Orleans.

(b) Frame members shall be sized and of the dimensions and placed as shown on the plans in the Office of the City Engineer.

(c) Heavy timbers shall be securely bolted together.

(d) Ceiling and floor joists shall be bridged.

(e) No timbers shall be cut in connection with plumbing or wiring without the knowledge and approval of the City Engineer and City Electrician.

129. ROOF COVERING: (a) The roof shall be covered with best quality Blue Bangor Slate; slates shall measure sixteen (16) inches by ten (10) inches, and be trimmed and drilled. They shall be laid with a lap of three (3) inches and double nailed. The top course on ridges shall be bedded in Slater's Cement.

(b) Ridges shall be covered with best quality ornamental English Ridge Tiles.

130. GUTTERS: (a) Gutters shall be eight (8) inch O. G. No. 26, galvanized iron.

(b) Down pipes shall be made of No. 26 galvanized iron; each down pipe shall be connected with yard drain, and fitted with a cast iron guard box, five (5) feet high.

131. LIGHTNING ROD: There shall be erected on the Office and Stable Building one (1) lightning rod, of the dimensions and erected and grounded in the same manner described in Section 71 of these specifications.

132. CEILING: The sofits of the roof outside the main walls and the ceiling throughout the first floor, shall be ceiled with seven-eighths (7-8) inch by three and one-quarter (3 1-4) inches clear face beaded ceiling.

133. PARTITIONS: Hall and room partitions on the second floor shall be formed of two (2) inch by four (4) inch studs, lathed and plastered as described in Sections 137 and 138 of these specifications.

134. FLOORS: (a) The floors of the several rooms, and the hall on the second story, shall be formed of a course of sheathing, seven-eighths (7-8) inches by ten (10) inches boards, laid diagonally on the joist and well nailed thereto with ten (10) penny nails, on which there shall be placed one (1) layer of two (2) ply asbestos roofing felt, and a surface of one and one-eighth (1 1-8) by three and one-quarter (3 1-4) inch, tongued and grooved, clear pine, rift sawed, flooring securely nailed; uneven surfaces shall be planed and made smooth.

(b) The floor of the first story, stalls excepted, shall be paved with vitrified brick.

135. BASE BOARD: A neat moulded base board shall be placed at the foot of the several walls in the rooms and hall on the second floor.

136. FURRING: The masonry walls in the several rooms and the hall on the second floor, shall be furred with seven-eighths (7-8) by two (2) inch cypress strips, spaced about sixteen (16) inches from centres apart.

137. LATHING: All walls and ceilings in the several rooms and hall on the second story, shall be lathed throughout with dry pine laths, laid three-eighths (3-8) of an inch from centres apart and joints broken every sixth course; laths shall be well nailed to every bearing.

138. PLASTERING: (a) The walls and ceilings in the several rooms and hall on the second story, shall be primarily plastered with two (2) coats of brown mortar and a finishing coat of white mortar. The finish plaster shall measure about seven-eighths (7/8) of an inch thick.

(b) The first coat shall be made of thoroughly slacked Ladd's, or other equally as good, lime, mixed with sand, to which there shall be added a free amount of long hair; on completion the first coat shall be thoroughly scratched to roughen it.

(c) The second coat shall be made of the same materials and applied in the same manner as the first coat, omitting the long hair; it shall be placed when the first coat is about half dried.

(d) The finishing coat shall be composed of one (1) part Ladd's, or other equally as good, lime putty, and three (3)

parts white sand. This coat shall be floated up with cork floats, and on completion have a rough surface.

139. HARDWARE: Hinges, locks, sash locks, sash lifts, sash cords and frame pulleys, shall be of suitable size and of the kind and quality described in Section 74 of these specifications; transom centres and lifts shall be bronzed steel.

140. WELL HOLE AND HOIST: (a) In the repair room there shall be constructed a well hole fitted with closing doors swung on heavy hinges; the well hole shall be inclosed with a double hand rail made of cast iron pipe securely fastened to the floor.

(b) The well hole shall be equipped with a four (4) inch single and double wooden block tackle suspended from the ceiling joist.

141. HEATING: (a) The several rooms and hall on the second story shall be heated by steam supplied by such system of pipes laid underground from the Power House as may be necessary.

(b) Ornamental radiators shall be installed competent to heat each of the rooms and the hall to a temperature of seventy (70) degrees Fahrenheit when the temperature of the atmosphere outside the building is twenty (20) degrees Fahrenheit.

142. LIGHTING: (a) The second story shall be wired for lighting with incandescent lamps, and such number of lamps shall be installed as may be necessary to thoroughly illuminate the several rooms and the hall.

(b) In the feed room there shall be installed four (4) thirty-two (32) candle power incandescent lamps. Two (2) high candle power enclosed arc lamps shall be installed in the stable room, and one (1) lamp of same kind shall be installed in the store-room.

(c) The wires for the lighting service shall be laid underground from the Power House, and where practicable, they shall be exposed in the building.

143. STORE-ROOM: (a) On each side of the store-room there shall be erected two (2) platforms fifteen (15) feet in length by seven (7) feet wide; the lower platform shall be about five (5) feet above the ground, and the upper platform about five (5) feet above the lower platform.

(b) The platforms shall be substantially framed and floored with two (2) inch planks; dressed pine lumber shall be used.

(c) The store-room shall be equipped with a three (3) ton capacity hand hoist formed of a set of differential chain blocks, suspended from the ceiling joist.

144. FEED ROOM: (a) In the feed room there shall be erected two (2) platforms of about the same height and constructed in the manner described in the preceding Section; the platforms will cover about one-half (½) the floor space of the feed room.

(b) In the remaining half of the feed room there shall be placed four (4) wide wooden shelves made of dressed pine lumber, and twenty-four (24) stout wooden pegs upon which to hang harness.

The shelves and pegs shall be securely fastened to the walls.

145. STALLS: (a) On the ground floor twelve (12) stalls shall be built.

(b) The floor of stalls shall be laid in a continuous length and formed of two (2) inch, single side, dressed pine boards, resting on two (2) by six (6) inch ground sills spaced about eighteen (18) inches from centres apart.

(c) Beneath and touching the floor there shall be a filling of clean cinders twelve (12) inches in thickness, thoroughly compacted.

(d) Stall partitions shall be made five (5) feet six (6) inches high, of one and three-eighths by twelve (1⅜x12) inches dressed pine, with cap and base. On top of the partitions there shall be placed a wire guard two (2) feet high made of three-sixteenth (3-16) inch wire set in one and one-quarter (1¼) inch channel iron frame.

(e) The partitions shall be firmly secured at one end to the brick wall, and shall be supported at the other end by a cast iron post, flanged at botton and securely screwed to the floor.

(f) Exposed wood work in and near the stalls, floor excepted, shall be covered with galvanized iron to prevent gnawing.

(g) In each stall there shall be erected a standard, metal, semi-circular feed box, and a standard, metal semi-circular hay rack.

Feed boxes and hay racks shall be securely anchored to the brick wall.

146. STAIRS: (a) No interior stairways will be built; two (2) landings and two (2) stairways shall be built on the

outside of the building at the points indicated on the plans in the Office of the City Engineer, and of the dimensions shown thereon.

(b) Landings and stairs shall be made of iron, neat pattern and design, and supported on substantial brackets securely anchored to the wall.

147. PAINTING: (a) All exterior metal and wood work, and the interior wood work on the lower floor, as well as such surfaces as in common practice are painted, shall, in addition to a priming coat, be painted with the materials and in the manner described in Section 84 of these specifications.

(b) All interior wood work on the upper floor, and the ceiling throughout the lower floor, shall be finished in hard oil.

(c) The exposed masonry throughout the interior of the lower floor shall be given two (2) coats of the best quality white wash.

148. EQUIPMENT: The office and Stable Building shall be supplied with the following:

(a) Twenty-four, high back, cane bottom oak, office chairs

(b) Three, average size, roller top oak, office desks.

(c) One single and one double, counting room, standing, oak desk, about ten (10) feet in length each, of good pattern, fitted with drawers and book rack on top.

(d) One, medium grade Brussels carpet for office room.

(e) One, good quality roller shade for each window on second story.

(f) Three, two (2) inch by four (4) feet by six (6) feet,

full seasoned cypress draughting boards, each mounted on two (2) horses, made of same material and substantially framed.

(g) Four (4) lines full seasoned cypress board shelves, finished in hard oil, extending around all the walls in the testing room, repair room and material clerk's office.

(h) Three, ten (10) feet by four (4) feet, plain top, work tables, made of two (2) inch full seasoned dressed cypress, substantially framed and mounted on turned legs.

(i) Twelve, first grade draft horses not younger than four (4) years nor older than six (6) years, gentle and broken to harness. Horses shall be sound in every respect, free from splints, spavins and other defects, in good condition, and they shall measure not less than fifteen and three-quarters (15¾) hands high and weigh not less than twelve hundred and fifty (1250) pounds.

(j) Two, double horse, high seat shifting top, Jos. Schwartz & Co.'s No. 16, or other equally as good, wagons, not less than five thousand (5000) pounds capacity each.

(k) Two, single horse, Perch Gear, wagons, Jos. Schwartz & Co.'s No. 3 make, or other equally as good, not less than three thousand (3000) pounds capacity each.

(l) Four, single horse, platform spring, piano box body, jumpers, not less than one thousand (1000) pounds capacity each.

(m) One, drummer's, end spring, piano box single horse buggy, full leather top and trimmings, with one and one-eighth (1⅛) inch Hickory wheel and steel axle.

(n) One, four horse, four wheel, log wagon.

(o) Two (2) sets, double express, six (6) sets, single express, and one (1) set, buggy, first grade leather harness with brass mountings; one set, heavy four horse team harness with stretchers for log wagon.

149. PRICE: The Office and Stable Building, including equipment, will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to complete and equip the building as described in Sections 119 to 148, inclusive, of these specifications.

The excavation will be paid for at the price bid, in the proposal, for that item.

OIL TANKS.

150. EXCAVATION: (a) Such excavation as may be necessary to properly lay the concrete foundation, and to erect the brick masonry walls of the vault, shall be made. It is estimated that the excavation will extend about fifteen (15) feet below the present ground surface.

(b) The price bid per cubic yard, in the proposal, for excavation will include the work of excavating, refilling and tamping and removing surplus earth from the premises.

(c) The contractor shall be careful not to make excavation of greater dimensions than the City Engineer and City Electrician prescribe; should he excavate to a greater extent than the City Engineer and City Electrician have designated he shall receive no compensation for the excess excavation.

(d) The contractor shall be responsible for sloughing, and he shall, at his expense, take such steps as may be deemed necessary to provide against sloughing; no compensation will be allowed for removing earth which has sloughed into the pit or for refilling and tamping the cavities so created.

(e) The contractor shall, at his expense, do such pumping as may be necessary to keep the trenches free of water so that the excavation may be completed and the foundation satisfactorily placed.

151. FOUNDATION: (a) The foundation shall be composed of a mass of concrete twenty-four (24) inches in thickness, laid in courses of not more than twelve (12) inches in thickness, as may be directed by the City Engineer and City Electrician; the foundation will extend slightly beyond the wall footings.

(b) The surface of the concrete foundation shall be sloped from the sides and ends so as to drain to a pool at the centre. This surface shall be covered for a thickness of one-half (½) inch with cement mortar of the quality employed in the surface course of artificial stone pavement.

(c) The concrete foundation will be paid for at the price bid per cubic yard, in the proposal, for concrete. The surface course will not be directly paid for; its value will be included in the price bid for Oil Tanks.

152. FOOTINGS: Wall footings shall be built of brick masonry, and of the dimensions shown on the plans in the Office of the City Engineer.

153. WALLS: The walls shall be built of brick masonry, and of the dimensions shown on the plans in the Office of the City Engineer.

154. IRON AND STEEL MEMBERS: Iron and steel members, forming a part of the roof and the roof supports of the vault, shall be of the quality described in Sections 51 and 52 of these specifications, and of the dimensions and placed as shown on the plans in the Office of the City Engineer.

155. VAULT ROOF: (a) The roof of the vault shall be formed of brick masonry arches between the "I" beams, and brought to true surface with concrete.

(b) The vault shall be vented according to the most modern and approved methods.

156. MANHOLES: At the ten (10) points indicated on the plans in the Office of the City Engineer, a manhole of the dimensions shown thereon, shall be constructed with a tight-fitting cast iron cover.

157. LADDERS: At the three (3) manholes the City Engineer and City Electrician will designate, there shall be erected substantial iron ladders extending from the top to the bottom of the vault. Ladders shall be securely anchored to the masonry at their tops and bottoms.

158. TANKS: (a) In the vault there will be placed four (4) tanks, each measuring fifty (50) feet in length and eight (8) feet in diameter.

(b) The tanks shall be made of steel sheets, three-sixteenths (3-16) of an inch in thickness, closely riveted and made water tight.

The end plates of each tank shall be stiffened with the necessary number of gusset plates, angle irons, etc.

(c) Each tank shall be equipped with a manhole, of the dimensions shown on the plans in the office of the City Engineer, and equipped with a tight-fitting cover. A suitable tight closing opening shall be provided in the bottom of each tank at its centre.

(d) The tanks shall rest upon oak wood saddles, of the dimensions and placed as shown on the plans in the Office of the City Engineer; the top of the saddles shall be sawed out to the curvature of the tank to insure full bearing of the tank on them.

(e) Each tank shall be equipped with a self-recording gage, and vented according to the most approved practice. Tank and vault vent pipes shall be carried underground to the Power House, and thence inside the Power House to and through the roof of the same.

(f) The tanks shall be equipped with a complement of supply and discharge pipes, including all necessary valves, cut-outs, etc., placed in accordance with the most approved practice.

159. PRICE: The Oil Tanks will be paid for at the price bid, in the proposal, for that item. The price bid will include all labor and materials necessary to complete them as described in Sections 152 to 158, inclusive, of these specifications.

The excavation and concrete foundation will be paid for at the price bid, in the proposal, for those items.

STREET WORK.

160. EXCAVATION: (a) Such excavation shall be made as may be necessary to lay the pipe line from the Power House to the New Basin Canal, described in Section 94 of these specifications; place manholes and conduits: and, to build the tunnel hereinafter described.

(b) The trenches in which the conduits or ducts will be placed will vary in depth from two (2) to five (5) feet, an average of about three and one-half (3½) feet, below the surface of the street or sidewalk.

(c) After the pipe line has been laid and the manholes and conduits have been put in place, and the tunnel built, the trenches shall be refilled in layers not exceeding six (6) inches in thickness, thoroughly tamped by hand; all surplus earth shall be removed by, and at the expense of, the contractor.

(d) Excavation will be paid for, by the cubic yard, at the price bid, in the proposal, for that item. The price bid will cover the work of excavating, refilling and tamping, and removing the surplus earth.

(e) The contractor shall be careful not to make excavations of any greater dimensions than the City Engineer and City Electrician prescribe; should he excavate to a greater extent than the City Engineer and City Electrician have designated, he shall receive no compensation for the excess excavation.

(f) The contractor shall be responsible for sloughing, and he shall, at his expense, take such steps as may be necessary to provide against sloughing; no compensation will be allowed for removing earth which has sloughed into the trenches, or for refilling and tamping the cavities so created.

(g) The contractor shall, at his expense, do such pumping as may be necessary to keep the trenches free of water in order that all parts of the work may be properly executed.

(h) Excavation which may be made for erecting posts or poles will not be counted and paid for as excavations; the price bid for posts and poles, of each class, will include the excavation incidental to their erection.

161. MANHOLES: (a) Manholes will vary in size according to local conditions; they shall be, in each case, of such dimensions as the City Engineer and City Electrician may designate. Such number of conduit inlets and outlets shall be built in the side walls as the exigencies of the service demand. The plans in the Office of the City Engineer illustrate the general style which will be followed in constructing manholes.

(b) Manholes shall be formed of a floor made of two (2) tiers of two (2) by twelve (12) inches, pecky, cypress boards, laid at right angles to each other and spiked together; a concrete foundation; brick masonry walls; and, a cast iron, tight-fitting, cover.

(c) The top of the manhole cover shall be checkered, and on it there shall be cast in raised letters, the letters: "M. L. & P. S."

(d) The several materials forming a manhole, including the

excavation necessary to place it, will be paid for at the price bid, in the proposal, for those items. Such roadway pavemen as may be relaid will be paid for separately at the price bid, i the proposal, for that item.

162. SUBSIDIARY MANHOLES: (a) Subsidiar manholes shall consist of two (2) classes, designated "A" and "B".

(b) Subsidiary manholes shall be of the dimensions show on the plans in the Office of the City Engineer. They shall b made of cast iron with outlet on four (4) sides to take spigo end of three (3) inch bell and spigot pipe; they shall b equipped with tight-fitting double covers. The manholes sha be cleaned and given two (2) coats of asphaltum paint, bot inside and outside, before being placed in position.

(c) The top of the outer cover shall be checkered and sha have cast on it in raised letters, the letters "M. L. & P. S."

(d) No foundation will be placed under subsidiary mar holes; care shall be taken to make no greater excavation tha may be necessary to place them. The soil upon which they wi rest shall be thoroughly tamped by hand to insure compactio and shall be brought to true surface before the manhole is pl in position. The trench shall be refilled and tamped in laye not exceeding six (6) inches in thickness; surplus earth sha be removed by and at the expense of the contractor.

(e) Subsidiary manholes will be paid for at the price bid, i the proposal, for each class. The price bid will include all ma terials and labor, including excavation, necessary to fully an entirely complete them in position for service. Such sidewall

pavement as may be relaid will be paid for separately at the price bid, in the proposal, or that item.

163. TUNNEL: (a) There shall be constructed from the Power House to a manhole on Cypress Street, a tunnel measuring about six (6) feet wide by about seven (7) feet high.

(b) The tunnel shall be formed of a sub-grade plank floor similar to that employed in constructing manholes; a concrete foundation; brick masonry side walls; and, covered with transverse "I" beams with brick masonry arches between, brought to true surface with concrete. The City Engineer and City Electrician will designate the dimensions of the several parts of the tunnel.

(c) Suitable metal brackets, securely anchored to the masonry walls, shall be placed in the tunnel to support one hundred and twenty (120) conductors.

(d) The tunnel and manhole on Cypress Street, shall be wired for incandescent lights, and a sufficient number of thirty-two (32) candle power lamps shall be installed to thoroughly illuminate the tunnel and the manhole.

(e) The several materials forming the tunnel and the equipment will be paid for at the price bid, in the proposal, for those items.

164. CONDUITS: (a) All conductors in the Underground District shall be placed in conduits or ducts. The conductors for forty-five (45) arc lamp circuits and one (1) incandescent circuit shall be placed in a large conduit laid under Cypress Street from a manhole in front of the Power House

to South Claiborne Street. Those conductors which form the circuits South of Cypress Street shall be placed in a conduit of South Claiborne Street to the New Basin Canal, and in a conduit on the South Side of that Canal to such point as the City Engineer and City Electrician will designate that they shall rise and change from Underground to Overhead.

(b) Conduits and ducts are divided into two (2) classes designated as "A" and "B", each class shall be placed on such lines and grades as the City Engineer and City Electrician may designate.

(c) Class "A" shall be a cast iron bell and spigot pipe twelve (12) feet in length, three (3) inches in diameter, weighing not less than an average of twenty (20) pounds to the lineal foot, bell included.

(d) Class "A" shall be laid as follows:

Under each joint, there shall be placed at right angles to the duct, a two (2) inch by six (6) inch by twelve (12) inch, pecky, cypress block, laid on its six (6) inch side.

The joints shall be first caulked with oakum, and then leaded, according to the most approved method of laying water pipes.

Connections with subsidiary manholes shall be made water tight.

Service ducts from manholes to lamp posts shall be the same quality and size cast iron pipe, and laid in the manner, above described. Service ducts shall be turned with an elbow near the base of the lamp, and extend up in the lamp with a spigot end at the height of the lamp post door.

(e) Class "A" ducts and elbows will be paid for at the prices bid, in the proposal, for those items. The prices bid will in-

clude all materials and labor, (excavation, refilling and tamping trenches, removing surplus earth, and relaying roadway and sidewalk pavements which will be paid for as separate items, excepted) that may be necessary to fully and entirely complete the ducts and elbows in position for service.

(f) Class "B" shall consist of vitrified salt glazed, three (3) inch multiple tiles, ducts of American Vitrified Conduit Co., or other equally as good manufacture. They shall be free of warps and all other defects, and laid in standard lengths. To save cutting, less than standard lengths shall be employed in making connections with manholes; care shall be taken to make manhole connections as nearly water-tight as practicable.

(g) Class "B" conduits shall consist of as many ducts as the exigencies of the service demand.

As the number of ducts in a conduit will vary, the conduits have been divided into seven (7) classes as follows:

No. 1.	2	ducts.
2.	6	"
3.	8	"
4.	16	"
5.	36	"
6.	56	"
7.	105	"

(h) Class "B" conduits shall be laid as follows:

On the bottom of the trench there shall be placed, at right angles to the line of the conduit, two (2) inch by twelve (12) inch, pecky, cypress boards, spaced four (4) feet from centres apart; these boards shall be of sufficient length to extend nine (9) inches beyond each side of the conduit.

On the transverse boards there shall be placed, lengthwise with the conduit, pecky, cypress boards, measuring two (2) inches in thickness, and of such widths as may be necessary to make their combined surfaces extend six (6) inches on both sides of the conduit; care shall be taken that the boards come in contact throughout with the bottom of the trench.

On the plank floor there shall be placed and thoroughly compacted, concrete three (3) inches in thickness; there shall also be placed and thoroughly compacted on both sides of the conduit and on its top, concrete three (3) inches in thickness, so that when the conduit is completed it shall be enveloped in concrete three (3) inches in thickness on bottom, top and both sides.

To insure thorough compaction of the concrete, temporary board frames shall be erected about the conduit while the concrete is being rammed in position.

The conduits shall be placed on the concrete before it has set, and they shall be centred with dowel pins at each joint. Each joint shall be wrapped with a six (6) inch strip of asphaltic burlap, and given a coat of mortar composed of one (1) part cement and two (2) parts sand, with just enough water added to make a mixture of proper working consistency.

The conduit on Cypress Street shall be laid in the manner described, except that the concrete shall measure six (6) inches in thickness on both the top and the bottom in lieu of three (3) inches.

(i) Class "B" conduits will be paid for, by the lineal foot, at the prices bid, in the proposal, for the respective sizes. The price bid will include all materials and labor, (excavation, re-

filling and tamping trenches, removing surplus earth, and relaying roadway pavements, which will be paid for as separate items, excepted) that may be necessary to complete the conduits in position for service.

165. LAMP POSTS AND POLES: (a) Lamp posts and poles are divided into three (3) classes, designated, "A", "B" and "C". The plans in the Office of the City Engineer illustrate the general style of each class; the plans also show by a purple disc where Class "A" will be placed, by a green disc where Class "B" will be placed, and by a red disc where Class "C" will be placed.

(b) Class "A" shall be the posts from which the lamps in the Underground District shall be suspended. They shall be a combination of wood and iron, and ornamental in design. The posts shall be made hollow, and the conductors shall be brought from the duct through the post to the lamp, in such manner as to conceal the conductors from view, and at the same time protect the public from accidental contact with them.

(c) Posts shall be equipped with regulation iron steps.

(d) Posts shall extend into the ground to the depth shown on the plans in the Office of the City Engineer; they shall rest upon a concrete foundation and be embedded in a mass of concrete as shown thereon.

Should the trench exceed the limits of the concrete, temporary frames shall be employed to control the position of the concrete while it is being rammed in place; when the concrete has thoroughly set, the frame shall be removed and the remaining trench shall be filled and thoroughly tamped with clean, dry earth. Surplus earth shall be removed by and at the expense of the contractor.

(e) Lamp posts will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor, including excavation, concrete, and removal of surplus earth, necessary to erect the posts in position for service. Such sidewalk pavement as may be relaid will be paid for separately at the price bid, in the proposal, for that item.

(f) Class "B" shall consist of the best quality clear, straight grained, heart cypress, or pine, free from sap, sawed square, tapered and smooth dressed poles. The poles shall be neatly chamfered from a point eight (8) feet from the ground to within twelve (12) inches of the lowest cross-arm; the tops shall be neatly roofed.

(g) The section of the pole in the ground and for one foot above the ground surface shall be creosoted.

(h) The poles shall be equipped with wooden foot-holds for the first eight (8) feet above the ground, and from that point to within eighteen (18) inches of the lowest cross-arm, with regulation iron steps.

(i) As Class "B" poles will vary in length they are divided into five (5) classes, as follows:

Number.	Length.	Bottom Dimension.	Top Dimension.
1	35′	10x10 inches	7x7 inches
2	40′	11x11 "	8x8 "
3	45′	12x12 "	9x9 "
4	50′	14x14 "	10x10 "
5	60′	16x16 "	12x12 "

(j) The poles shall be set vertically true and not less than six feet in the ground, and deeper, if deemed necessary by the City Engineer and City Electrician.

(k) The trench in which a pole is to be erected shall be cut six and one-half (6½) feet deep and twelve (12) inches larger in square, than the square of the pole. The poles shall be made to rest on six (6) inches of sand and gravel mixed in the proportion of one (1) part sand to two (2) parts gravel; the trenches shall be filled and tamped with sand and gravel mixed in the same proportion. Surplus earth shall be removed by and at the expense of the contractor.

(l) To the pole, at such height as the City Engineer and City Electrician may designate. there shall be securely attached a neat metal bracket of the dimensions and style shown on the plans in the Office of the City Engineer, and fastened to the pole as shown thereon.

(m) Poles shall be equipped with a three-eighth (⅜) inch steel tiller-rope, and sleet-proof sheaves for lowering and raising lamps that they may be trimmed from the ground. Hoists shall be fitted with a standard insulated joint or "Circuit Breaker", and they shall be made to fasten to the Pole with a substantial staple, ring, pad-lock and key.

(n) Class "B" poles will be paid for at the price bid, in the proposal, for the respective sizes. The price bid will include all materials and labor, including the excavation and gravel filling, and removal of surplus earth, necessary to erect them in position for service. Such sidewalk pavement as may be relaid will be paid for separately at the price bid, in the proposal, for that item.

(o) Should the City Engineer and City Electrician deem it necessary to employ concrete in erecting lamp poles, the concrete will be paid for separately by the cubic yard, at the price bid, in the proposal, for that item.

(p) Class "C" shall, with the exception of the bracket from which the lamp will be suspended, be the same kind of pole as described for Class "B". They shall be erected, equipped and paid for in the manner described for Class "B" poles.

The only difference between Class "B" and Class "C" poles is in the matter of the attachment from which the lamp will be suspended. For Class "C" the attachment shall be a neat metal crane, of the style and dimensions shown on the plans in the Office of the City Engineer, and securely fastened to the pole as shown thereon.

166. CIRCUIT POLES: (a) Circuit poles shall be the same kind of pole as described for Classes "B" and "C", but with the bracket or metal crane and equipment omitted.

(b) Circuit poles are those poles that will carry conductors between lamp poles in the Overhead District; they will be placed about one hundred (100) feet apart, or from lamp poles, and they shall be erected in the same manner as Class "B" and Class "C" poles.

(c) Circuit poles will be paid for at the prices bid, in the proposal, for the respective sizes. The price bid will include all materials and labor, including excavation, sand and gravel filling and removal of surplus earth, necessary to erect them in position for service. Such sidewalk pavement as may be relaid will be paid for at the price bid, in the proposal, for that item.

167. CROSS-ARMS: (a) Cross-arms shall be made of the best quality, straight grained, all heart, full seasoned and dressed, cypress, free from wind shakes, knot holes and other defects; no cross-arm shall be attached to a pole nearer the ground than twenty-five (25) feet.

(b) Cross-arms are divided into two (2) classes, designated as No. 1, which shall be for four (4) pins, and No. 2, which shall be for six (6) pins.

(c) Pin holes shall measure one and one-half (1½) inches in diameter, and they shall be neatly and truly bored. The first pin hole shall be bored nine (9) inches from the centre of the pole, and the other pin holes shall be bored twelve (12) inches from centres apart.

(d) Cross-arms, Class No. 1, shall measure four (4) inches, by five (5) inches, by fifty-four (54) inches in length; the top shall be rounded.

(e) Cross-arms, Class No. 2, shall measure four and one-half (4½) inches by six (6) inches, by seventy-eight (78) inches in length; the tops shall be rounded.

(f) The poles at the points at which the cross-arms will be attached, for the width of the cross-arm, shall be cut out one-half (½) of an inch deep, into which the cross-arm shall be snugly fitted at right angles to the pole; in addition, each cross-arm shall be fastened to the pole with two (2) five-eighths (⅝) inch bolts, passing through the poles and held by nuts and washers. Each cross-arm shall be braced by two (2) two (2) inches by three-eighths (⅜) inch, by thirty (30) inches, galvanized iron braces; braces shall be securely fastened to the pole with large screws and to the cross-arm with carriage bolts passing through the cross-arm.

(g) Where more than one cross-arm is attached to a pole, the interval between the cross-arms shall not be less than two (2) feet from centres.

(h) Cross-arms shall be given a priming coat of paint before being placed in position.

(i) Cross-arms will be paid for at the price bid, in the proposal, for the respective sizes. The price bid will include all materials and labor necessary to place the cross-arms in position for service.

168. CROSS-ARM PINS: (a) Cross-arm pins shall be made of the best quality, full seasoned locust, of standard size, and set in the cross-arm with a light driving fit.

(b) Cross-arm pins will be paid for, by the hundred, at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to place the cross-arm pin in position for service.

169. INSULATORS: (a) Insulators shall be made of the best quality glass, of double petticoat pattern; insulators shall prove a test of ten thousand (10,000) volts.

(b) Insulators will be paid for, by the hundred, at the price bid, in the proposal, for that item. The price bid will include all materials and labor necessary to place the insulators in position for service.

170. GUYS: (a) Such lamp poles or circuit poles as the City Engineer and City Electrician may designate shall be substantially braced with a guy stub and guy.

(b) Guy stubs shall be made of the same quality lumber as lamp poles. Guy stubs shall measure sixteen (16) feet long, twelve (12) inches, by twelve (12) inches, at the base, and

ten (10) inches, by ten (10) inches, at the top; they shall be sawed square, dressed, tapered and chamfered, and the top shall be roofed.

(c) Guy stubs shall extend six (6) feet in the ground, which length, and for a length one foot above the ground surface shall be creosoted; with the exception of being given such batter as the City Engineer and City Electrician may designate, they shall in all other respects be erected in the same manner as lamp poles and circuit poles.

(d) Guys shall consist of a stranded galvanized steel wire cable measuring three-eighths (3/8) of an inch in diameter, equipped with a one-half (1/2) inch, galvanized iron turn buckle, placed near the stub. The length of the cable will vary depending on the height of pole and local conditions; the cable will average about one hundred (100) feet in length.

(e) On the lamp poles and on the stubs, there shall be fastened a substantial iron stirrup fitted with double eyes through which the cable shall be passed to secure it; the ends of the cable may be either spliced or neatly wrapped with binding wire, or such other device may be employed as will accomplish a substantial fastening.

(f) Guys will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor, including the excavation, sand and gravel filling, and removal of surplus earth, necessary to complete the guys in position for service. Such sidewalk pavement as may be relaid will be paid for separately at the price bid, in the proposal, for that item.

(g) Should the City Engineer and City Electrician deem it necessary to employ concrete in erecting guy stubs, the concrete will be paid for separately, by the cubic yard, at the price bid, in the proposal, for that item.

171. TRUNK LINE POLES: (a) Trunk line poles shall be made of the best quality, clear, straight grained, heart cypress, or pine, free from sap, sawed square, tapered and smooth dressed poles.

(b) The poles shall be neatly chamfered from a point eight (8) feet from the ground to within twelve (12) inches of the lowest cross arm; the top shall be neatly roofed.

(c) The poles shall be set vertically true and they shall extend eight feet in the ground; the section of the pole in the ground and for one foot above the ground surface shall be creosoted.

(d) As the poles will vary in length they are divided into four (4) classes, as follows:

Number.	Length.	Bottom Dimension.	Top Dimension.
1.	40′	12x12 inches	9x 9 inches
2.	45′	14x14 "	10x10 "
3.	50′	16x16 "	12x12 "
4.	60′	18x18 "	12x12 "

(e) Trunk line poles shall be erected in the following manner:

The trench in which a pole is to be erected shall be cut nine (9) feet deep and nineteen (19) inches larger in square than the square of the pole. In the bottom of the trench there shall

be placed a thoroughly compacted foundation measuring twelve (12) inches in thickness and nineteen (19) inches larger in square than the square of the butt end of the pole. On the concrete foundation there shall be placed, vertically true, a substantially built box, formed of one and one-half (1½) inches, all heart cypress, lumber. Six (6) inches of thoroughly compacted concrete, extending from the bottom to the top of the box, shall be placed on the outside of the four sides of the box. Should the trench exceed the limits of the concrete, temporary frames shall be employed to control the position of the concrete while it is being rammed in place; when the concrete has thoroughly set, the frame shall be removed and the remaining trench shall be filled and thoroughly tamped with clean, dry earth. Surplus earth shall be removed by and at the expense of the contractor.

When the pole has been erected and the centre of the pole adjusted to the centre of the box, the two (2) inch space between the sides of the pole and the sides of the box, shall be filled and tamped with sand.

(e) Trunk line poles will be paid for at the price bid, in the proposal, for the respective sizes. The price bid will include all materials and labor, including excavation, concrete, box, sand filling, and removal of surplus earth, necessary to erect the poles in position for service. Such sidewalk pavement as may be relaid will be paid for separately at the price bid in the proposal, for that item.

172. TRUNK LINE CROSS-ARMS: (a) Trunk line cross-arms shall be made of the materials and attached to the poles in the manner described in Section 167 of these specifications.

(b) Trunk line cross-arms are divided into three classes designated, No. 1, which shall be for four pins; No. 2, which shall be for six pins; and No. 3, which shall be for eight pins.

(c) Pin holes shall measure one and one-half (1½) inches in diameter, and they shall be neatly and truly bored. The first pin hole shall be bored nine (9) inches from the centre of the pole, and the other pin holes shall be bored twelve (12) inches from centres apart.

(d) Trunk Line Cross-Arms, Classes Nos. 1 and 2, shall be of the same dimensions as Cross-Arms Classes No. 1 and 2, described in Section 167 of these specifications. Trunk line cross-arms No. 3, shall measure four and one-half (4½) inches, by six (6) inches, by eighty-two (82) inches in length; the top shall be rounded.

(e) Trunk line cross-arms shall be given a priming coat of paint before being placed in position; they shall be attached to the pole in the manner described in Section 167 of these specifications.

(f) Where more than one cross-arm is attached to a pole, the interval between cross-arms shall not be less than two (2) feet from centres.

(g) Cross-arms will be paid for at the price bid, in the proposal, for the respective sizes. The price bid will include all materials and labor necessary to place the cross-arm in position for service.

173. TRUNK LINE CROSS-ARM PINS: (a) Trunk line cross-arm pins shall be made of the material, placed in the manner, and paid for, as described in Section 168 of these specifications.

174. TRUNK LINE INSULATORS: (a) Trunk line insulators shall be made of the materials, placed in the manner, and paid for, as described in Section 169 of these specifications.

175. TRUNK LINE GUYS: (a) Such trunk line poles as the City Engineer and City Electrician may designate shall be substantially braced with a guy stub and guy.

(b) Guy stubs shall be made of the same quality lumber as the trunk line pole. Guy stubs shall measure eighteen (18) feet long, fourteen (14) inches, by fourteen (14) inches at the base, and twelve (12) inches, by twelve (12) inches at the top; they shall be sawed square, chamfered, dressed and tapered, and the top shall be roofed.

(c) Guy stubs shall extend eight (8) feet in the ground which length and for a length one foot above the ground surface shall be creosoted; with the exception of being given such batter as the City Engineer and City Electrician may designate, they shall, in all other respects, be erected in the same manner as the trunk line poles.

(d) Guys shall consist of a stranded galvanized steel wire cable measuring five-eighths of an inch in diameter, equipped with a five-eighths (5/8) inch turn buckle, placed near the stub. The length of cable will vary depending on the height of the pole and local conditions; the cable will average about one hundred (100) feet in length.

(e) On the trunk line poles and on the stubs there shall be fastened a substantial stirrup fitted with double eyes through which the cable shall be passed to secure it; the ends of the cable may be either spliced or neatly wrapped with binding wire, or

such other device may be employed as will accomplish a substantial fastening.

(f) Trunk line guys will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor, including excavation, concrete, box, sand filling, and removal of surplus earth, necessary to erect the guys in position for service. Such sidewalk pavement as may be relaid will be paid for separately at the price bid, in the proposal, for that item.

176. CABLE BOXES: (a) Cable boxes shall be made of the best grade, all heart, full seasoned, one and three-sixteenths (1 3-16) inch, dressed, cypress lumber. They shall measure about thirty-six (36) inches high, about twenty (20) inches wide, and about ten (10) inches deep, and be roofed with gable roof. Joints shall be neatly made, close fitting, and puttied to make the box as near weather-proof as practicable.

(b) Cable boxes shall be equipped with a substantially framed, tight-fitting, door hung on butt hinges, and equipped near top and bottom with a hasp and suitable pad-lock and key.

(c) Cable boxes shall be securely fastened to the pole.

(d) Cable boxes will be paid for at the price bid, in the proposal, for that item. The price bid will include all materials and labor, necessary to erect them in position for service.

177. RELAYING ROADWAY AND SIDEWALK PAVEMENTS: (a) Such roadway and sidewalk pavements, as may be disturbed by the contractor in placing sub-surface structures, shall be relaid with materials of the same kind and in the same manner as the original pavement.

(b) Roadway and sidewalk pavements shall be relaid in a manner satisfactory to the City Engineer and Commissioner of Public Works, and maintained in good condition to their satisfaction by the contractor at his expense, for a period of one year after the completion of the entire Lighting and Power System.

(c) Roadway and sidewalk pavements, of the several kinds which may be relaid, will be paid for at the price bid, per square yard, in the proposal, for relaying the respective pavements. The price bid will include all materials and labor employed in taking up and relaying the pavement.

(d) The contractor shall be careful not to disturb any more roadway or sidewalk pavement than is absolutely necessary to place the sub-surface structures in position; should he disturb any greater area of pavement than the City Engineer and City Electrician deem necessary, he shall receive no compensation for taking up and relaying the pavement unnecessarily disturbed.

178. CONDUCTORS: (a) Conductors will consist of nine classes designated, "A", "B", "C", "D", "E", "F", "G", "H" and "I".

(b) Class "A", shall be a solid copper wire, ninety-seven (97) per cent. conductivity, size No. 6 B. & S. Gage and covered with an approved weather-proof, triple-braid, insulation. This class of conductor will be for general overhead lines.

(c) Class "B", shall be a solid copper wire, ninety-seven (97) per cent. conductivity, size No. 6 B. & S. Gage. The insulation finish shall be not less than five-thirty-seconds (5-32)

of an inch rubber and three-thirty-seconds (3-32) of an inch lead in thickness; the lead jacket shall be protected by a double wrap of asphalted jute. This class of conductor will be employed in the Underground District for arc lighting.

The voltage pressure shall prove a test of not less than twelve thousand (12,000) volts.

(d) Class "C", shall be a double conductor of copper, each, ninety-seven (97) per cent. conductivity (stranded), size No. 6 B. & S. Gage. The insulation finish shall be six-thirty-seconds (6-32) of an inch rubber and one-tenth (1-10) of an inch lead, in thickness, double wrapped with asphalted jute and wire armored; the size of armor shall be No. 8 iron wire. This class of conductor will be employed in crossing the Mississippi River.

The voltage pressure shall prove a test of not less than sixteen thousand (16,000) volts.

(e) Class "D", shall be stranded copper, ninety-seven (97) per cent. conductivity; the insulation finish shall not be less than five-thirty-seconds (5-32) of an inch rubber and three-thirty-seconds (3-32) inch lead, in thickness. This class of conductor will be employed for Power House connections.

The voltage pressure shall prove a test of not less than twelve thousand (12,000) volts.

(f) Class "E", shall be a five conductor cable; each conductor shall be solid copper wire, ninety-seven (97) per cent. conductivity, size No. 6 B. & S. Gage; the insulation finish shall be not less than five-thirty-seconds (5-32) of an inch rubber and three-thirty-seconds (3-32) of an inch lead, in thickness; the lead jacket shall be armored with band steel. This class of

conductor will be employed as risers to connect Underground and Overhead conductors.

The voltage pressure shall prove a test of not less than twelve thousand (12,000) volts.

(g) Class "F", shall be a five conductor cable; each conductor shall be a solid copper wire, ninety-seven (97) per cent. conductivity, size No. 6 B. & S. Gage; the insulation finish shall be six-thirty-seconds (6-32) of an inch rubber and one-tenth (1-10) of an inch lead, in thickness, double wrapped with asphalted jute and wire armored; the size of armor shall be No. 8 iron wire.

This class of conductor will be employed in crossing the New Basin Canal and the Old Basin Canal. Two more cables of five (5) conductors each, than are necessary to serve the circuits, will be laid across each canal for reserve use in the event of injury to the service cables.

The voltage pressure shall prove a test of not less than sixteen thousand (16,000) volts.

(h) Class "G", shall be a single conductor of copper wire, ninety-seven (97) per cent. conductivity (Stranded and flexible), size No. 6 B. & S. Gage; the insulation finish shall be rubber covered with double braid. This class of conductor will be employed in the Overhead District for service from main conductors to the terminal binding posts of arc lamps.

(i) Class "H", shall be a solid copper wire ninety-seven (97) per cent. conductivity, size No. 3 B. & S. Gage; the insulation finish shall be the same as for Class "A". This class of conductors will be used for the Overhead mains for supplying incandescent service.

(j) Class "I", shall be a stranded copper wire ninety-seven (97) per cent. conductivity, size No. 3, B. & S. Gage. The insulation finish shall be the same as for Class "B". This class of conductors will be used for the Underground mains for the incandescent service.

(k) Conductors, Class "D", excepted, will be paid for, by the lineal foot, at the price bid, in the proposal, for the respective classes. The price bid will include the conductor and all labor necessary to place it in position for service on the poles or in the conduits. The value of Class "D" conductor, that will be placed in the Power House, will be included in the amount bid, in the proposal, for Power House Equipment.

179. LAMPS: (a) Lamps shall be of the most approved pattern and of the "Series Alternating Enclosed, 475 watt Type;" the loss of energy in the lamp mechanism shall not exceed thirty (30) watts.

(b) Lamps shall be fitted with carbons enclosed by and consumed within a close-fitting glass globe, which shall be as the City Engineer and City Electrician may direct, either clear or opalescent, in order to insure perfect diffusion of light, and at the same time remove the glare of the electric arc. The enclosing globe, and the lower frame of the lamp, shall be enclosed in or surrounded by a large protecting globe of either clear or opalescent glass, as the City Engineer and City Electrician may designate.

(c) It is the intention of the city in the general case to employ clear interior and outer globes; opalescent globes will be employed to meet special local conditions. Should the City

Engineer and City Electrician fail to designate the number and location of opalescent globes, the contractor shall then install clear globes.

(d) Immediately above the outer globe there shall be placed a metal reflector so designed as to intersect and reflect to the ground surface much of the light that would otherwise be lost in space. Reflectors shall be of iron, or other durable material, and measure not less than twenty (20) inches in diameter; they shall be of slightly concave form on their reflecting surfaces and be painted some dark color on top. The lamps shall give a steady, brilliant diffused light, free from shadows cast by the frame of the lamp.

(e) Lamps shall be hung so that the arc of the lamp shall be from twelve (12) feet to eighteen (18) feet above the surface of the street, as may be directed by the City Engineer and City Electrician.

180. PAINTING: (a) Lamp posts, lamp poles, circuit poles, lamp and circuit pole guy stubs, trunk line poles, trunk line guy stubs, cross-arms, brackets, cranes and cable boxes, shall, in addition to such priming coat as may have been prescribed, be given two (2) coats of the best grade oil, lead and zinc paint, of such colors as the City Engineer and City Electrician may designate.

(b) There shall be neatly painted on the lamp poles and circuit poles, the number of the pole and the number of the circuit to which the pole belongs; there shall be neatly painted on the trunk line poles the number of the pole and the number of the trunk line to which the pole belongs.

(c) No direct payment will be made for the painting described in the two preceding paragraphs. The prices bid, in the proposal, for the items which shall be painted, will include the prescribed painting.

181. CIRCUIT: (a) The distribution of energy to the arc lamps is embraced in fifty-three (53) circuits of approximately fifty (50) lamps each. The lamps on the East bank of the Mississippi River are included in fifty-one (51) circuits, and those on the West Bank of the Mississippi River are included in two (2) circuits.

(b) The distribution of energy to the public buildings is embraced in two (2) circuits, both of which are on the East Bank of the Mississippi River.

(c) The following statement describes the route through the streets which it is intended that the several circuits shall traverse.

Circuits Nos. 1 to 25, inclusive, embrace all arc lights in the territory bounded by Howard Avenue and the New Basin Canal, Metairie Road, Upper Limits of the City, and the Mississippi River.

Circuits Nos. 26 to 51, inclusive, embrace all arc lights in the territory bounded by Howard Avenue and the New Basin Canal, Lake Pontchartrain, the Lower Limits of the City, and the Mississippi River.

Sections 52, and 53, embrace all the arc lights in that section of the City of New Orleans situated on the West Bank of the Mississippi River.

ARC CIRCUIT No. 1, 48 lamps, commences at the Power House and runs underground on Cypress Street to South Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal where it will change to overhead and proceed as follows: South Claiborne to Calliope, to Carondelet, to Clio, to Willow, to Erato, to Carondelet, to Thalia, to S. Claiborne, to Power House.

LOOPS: Willow, Calliope to Euphrosine; Magnolia, Calliope to New Basin Canal; S. Robertson, Calliope to Euphrosine; Freret, Calliope to New Basin Canal; S. Liberty, Calliope to New Basin Canal; S. Franklin, Calliope to New Basin Canal; S. Rampart, Calliope to Euphrosine.

ARC CIRCUIT No. 2, 47 lamps, commences at the Power House and runs underground on Cypress Street to South Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal where it will change to overhead and proceed as follows: S. Claiborne to Calliope, to St. Charles Avenue, to Erato, to Camp, to Poeyfarre, to Magazine, to Erato, to Constance, to Poeyfarre, to Annunciation, to Erato, to Tchoupitoulas, to Calliope, to Levee, to Thalia, to S. Claiborne, to Power House.

LOOPS: Erato, Camp and Prytania; Calliope, Common to Howard Avenue; Calliope, S. Peters to Clio; Levee, Clio to S. Peters; Levee, S. Peters to Levee; Levee, Erato to S. Peters; Thalia, St. Thomas to Theresa; Thalia, S. Peters and River.

ARC CIRCUIT No. 3, Fifty (50) lamps, commences at

the Power House and runs underground on Cypress Street to South Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal where it will change to overhead and proceed as follows: S. Claiborne to Melpomene, to St. Thomas, to Bellechasse, to Tchoupitoulas, to Hunter, to S. Peters to Terpsichore, to Delta, to Henderson, to Tchoupitoulas, to Terpsichore, to Magazine, to Robin, to S. Peters, to Race, to Constance, to Orange, to S. Peters, to Richard, to Magazine to Race, to Camp, to Melpomene, to S. Claiborne, to Power House.

LOOPS: Delta, Terpsichore to Hunter; Robin, S. Peters to Delta, four (4) lamps in the Annunciation Square.

ARC CIRCUIT No. 4, Forty-nine (49) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Melpomene, to Coliseum, to Polymnia, to Prytania, to Terpsichore, to St. Charles, to Polymnia, to Carondelet, to Terpsichore, to Baronne, to Euterpe, to Saratoga, to Terpsichore, to Felicity Road, to S. Claiborne, to Power House.

LOOPS: Two (2) lamps Dryades Market, four (4) lamps in Coliseum Place, a loop Coliseum and Polymnia to Camp to lamps; Coliseum and Urania, Felicity Road and Chestnut, Camp Street Orange and Felicity Road. S. Rampart, Uterpe and Terpsichore.

ARC CIRCUIT No. 5, Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Felicity Road, to St. Charles Avenue, to St. Mary, to Tchoupitoulas, to Felicity Road, to St. James, to S. Peters, to Market, to Annunciation, to Felicity Road, to Laurel, to St. Mary, to St. Charles Avenue, to Felicity Road, to S. Claiborne, to Power House.

LOOPS: Two lamps in Keller Market; Prytania, St. Mary to Felicity Road; two lamps Magazine Market; Felicity Road, Laurel to Constance; S. Peters, St. James to Celeste.

ARC CIRCUIT No. 6. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to St. Andrew, to Tchoupitoulas, to Josephine, to Claiborne, to Power House.

LOOPS: St. Thomas, St. Andrew to Adele; Rousseau, St. Andrew to Adele.

ARC CIRCUUIT No. 7. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Jackson

Avenue, to Tchoupitoulas, to First, to Rousseau, to Philip, to St. Charles Avenue, to Jackson Avenue, to Claiborne, to Power House.

LOOPS: One lamp Soraparu Market; Chippewa, Philip to Soraparu; Annunciation, Philip to Soraparu; Jackson Avenue. S. Claiborne to Derbigny.

ARC CIRCUIT No. 8. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to First, to Chippewa, to Second, to Claiborne, to Power House.

LOOPS: Clara, First to Philip; S. Robertson, First to Philip; Howard, First to Philip; S. Liberty, First to Philip; Saratoga, First to Philip; S. Rampart, First to Philip; Dryades, First to Philip; Baronne, First to Philip; Carondelet, First to Philip; Second Street Market, one lamp.

ARC CIRCUIT No. 9. Forty-nine (49) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Third, to St. Thomas, to Second, to Tchoupitoulas, to Fourth, to Howard, to Washington Avenue, to Claiborne, to Power House.

LOOPS: Four lamps Morris Park; two lamps Clay Square; St. Thomas, Second to First; S. Robertson, Washington to Fourth; Willow, Washington to Fourth; Third, Tchoupitoulas to Rousseau.

ARC CIRCUIT No. 10. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Washington Avenue, to Tchoupitoulas, to Sixth, to Howard Street, to Washington Avenue, to S. Claiborne, to Power House.

LOOPS: St. Charles Avenue, Sixth to Conery; Carondelet, Sixth to Conery; Prytania, Sixth to Seventh; Coliseum, Sixth to Seventh; Camp, Sixth to Seventh; Magazine, Sixth to Seventh; Constance, Sixth to Seventh; Annunciation, Sixth to Seventh; St. Thomas, Sixth to Seventh; Prytania, Sixth to Conery.

ARC CIRCUIT No. 11. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Toledano, to Magazine, to Harmony, to Tchoupitoulas, to Eighth, to St. Charles Avenue, to Seventh, to Saratoga to Toledano, to S. Claiborne, to Power House.

LOOPS: Two lamps Ninth Street Market; Freret, Toledano to Harmony; S. Liberty, Toledano to Harmony; Dryades, Toledano to Harmony; Baronne, Toledano to Harmony; Coliseum, Toledano to Harmony; Chestnut, Toledano to Pleasant; Harmony, Magazine to Camp; St. Thomas, Harmony to Ninth; Prytania, Eighth to Harmony; Carondelet, Seventh to Eighth; Annunciation, Harmony to Ninth.

ARC CIRCUIT No. 12. Fifty-two (52) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Constance, to Toledano, to Tchoupitoulas, to Louisiana Avenue, to Laurel, to Delachaise, to Howard, to Louisiana Avenue, to South Claiborne, to Power House.

LOOPS: Louisiana Avenue, Tchoupitoulas to Water; Tchoupitoulas, Louisiana Avenue to Delachaise; Laurel, Delachaise to Aline; Aline, Laurel to Annunciation; Magazine, Delachaise to Aline; Chestnut, Delachaise to Aline; Prytania, Delachaise to Aline; St. Charles, Delachaise to Foucher; Carondelet, Delachaise to Foucher; Baronne, Delachaise to Foucher; S. Rampart, Delachaise to Foucher; S. Liberty, Delachaise to Foucher; Saratoga, Delachaise to Foucher; Laurel, Toledano to Pleasant; Annunciation, Toledano to Pleasant; St. Thomas, Toledano to Pleasant.

ARC CIRCUIT No. 13. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Amelia, to Prytania, to Foucher, to Tchoupitoulas, to Peniston, to St. Charles Avenue, to Gen. Taylor, to S. Rampart, to Amelia, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Chestnut, Foucher to Antonine; Camp, Foucher to Amelia; Magazine, Foucher to Antonine; Laurel, Foucher to Antonine; Annunciation, Foucher to Antonine; Peniston, Tchoupitoulas to Water; Annunciation, Amelia to Gen. Taylor; Laurel, Amelia to Gen. Taylor; Constance, Amelia to Gen. Taylor; Magazine, Amelia to Gen. Taylor; Camp, Peniston to Gen. Taylor; Chestnut, Peniston to Austerlitz; Coliseum, Amelia to Gen. Taylor; Perrier, Peniston to Austerlitz; Prytania, Peniston to Gen. Taylor; Carondelet, Gen. Taylor to Peniston.

ARC CIRCUIT No. 14. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Marengo, to St. Charles Avenue, to Constantinople, to Tchoupitoulas, to Marengo, to Prytania, to Milan, to Tchoupitoulas, to Berlin, to Pitt, to Milan, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Magazine, Constantinople to Austerlitz; Laurel, Constantinople to Austerlitz; Tchoupitoulas, Constantinople to Austerlitz.

ARC CIRCUIT No. 15. Forty-eight (48) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to

Louisiana Avenue, to Magnolia, to Napoleon Avenue, to Howard, to Berlin, to Franklin, to Napoleon Avenue, to Water, to Jena, to S. Liberty, to Napoleon Avenue, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Rampart, Napoleon Avenue to Berlin; Dryades. Napoleon Avenue to Berlin; Baronne, Napoleon Avenue to Berlin; Carondelet, Napoleon Avenue to Berlin; St. Charles Avenue, Napoleon Avenue to Berlin, two lamps in the Lawrence Square; one lamp in Berlin Street Market; Napoleon Avenue, Magnolia to Willow.

ARC CIRCUIT No. 16. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Cadiz, to Tchoupitoulas, to Valence, to Prytania, to Bordeaux, to Tchoupitoulas, to Lyon, to Prytania, to Upper Line, to Pitt, to Bordeaux, to St. Charles Avenue, to Valence, to Liberty, to Cadiz, to Magnolia, to Louisiana Avenue, to Claiborne, to Power House.

LOOPS: Laurel, Lyon to Upper Line; Magazine, Lyon to Upper Line; Chestnut, Lyon to Upper Line; Perrier, Lyon to Upper Line.

ARC CIRCUIT No. 17. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to

overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Upper Line, to Bordeaux, to Carondelet, to Upper Line, to St. Charles Avenue, to Robert, to Tchoupitoulas, to Soniat, to Pitt, to Dufossat, to Tchoupitoulas, to Bellecastle, to Coliseum, to Valmont, to Hurst, to Dufossat, to St. Charles, to Soniat, to Rampart, to Bordeaux, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Tchoupitoulas, Robert to Upperline; Tchoupitoulas, Bellecastle to Valmont; Constance, Bellecastle to Valmont; Annunciation, Bellecastle to Valmont; Magazine, Bellecastle to Valmont; Camp, Bellecastle to Valmont; Baronne, Dufossat to Soniat; Baronne, Robert to Soniat; S. Rampart, Dufossat to Soniat; Dryades, Bordeaux to Upper Line.

ARC CIRCUIT No. 18. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Peters Avenue, to Dryades, to Valmont, to St. Charles Avenue, to Leontine, to Tchoupitoulas, to Peters Avenue, to Garfield, to Octavia, to Tchoupitoulas, to Joseph, to St. Charles Avenue, to Peters Avenue, to Magnolia, to Louisiana Avenue to S. Claiborne, to Power House.

LOOPS: Peters Avenue, Atlanta to Hurst; Franklin, Peters Avenue to Octavia.

ARC CIRCUIT No. 19. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to South Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Joseph, to Rampart, to Arabella, to Tchoupitoulas, to State, to Pitt, to Eleonora, to Annunciation, to Nashville Avenue, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: S. Franklin, Nashville Avenue to Arabella; Rampart, Joseph to Octavia.

ARC CIRCUIT No. 20. Forty-nine (49) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to State, to Garfield, to Webster, to Tchoupitoulas, to Henry Clay Avenue, to Hurst, to Webster, to St. Charles Avenue, to Henry Clay Avenue, to Freret, to Calhoun, to Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Benjamin, Webster to Henry Clay; Saratoga, Henry Clay to Calhoun; Liberty, Henry Clay to Calhoun; St. Charles Avenue, State to Eleonore; Garfield, State to Eleonore; Saratoga, State to Eleonore; S. Rampart, State to Eleonore.

ARC CIRCUIT No. 21. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia, to Calhoun, to Tchoupitoulas, to Exposition Boulevard, to St. Charles Avenue, to Rosa Park, to Maple, to Audubon, to Oak and Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: On main line Exposition Boulevard loop eighteen (18) lamps in Audubon Park.

ARC CIRCUIT No. 22. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia and Oak, to Broadway, to St. Charles, to Audubon, to Carrollton, to Walnut, to River, to Audubon, to Irma, to Broadway, to River, to Pine, to Felicia, to Broadway, to Carrollton, to Pine, to Oak, and Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: On main line Walnut Street loops, thirteen (13) lamps in Audubon Park; Elizabeth, Pine to River.

ARC CIRCUIT No. 23. Forty-nine (49) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to

Louisiana Avenue, to Magnolia and Oak, to Adams, to Zimple, to Hillary, to Elm, to Adams, to Burthe, to Hillary, to Maple, to Adams, to St. Charles Avenue, to Burdette, to Commercial, to Adams, to Mississippi, to Hillary, to Hampson, to Cherokee, to Ester, to Millaudon, to Wall, to Gen. Scott, to Gen. Hood, to Lowerline, to Oak and Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Oak, Lowerline to Cherokee; St. Charles Avenue, Lowerline to Millaudon; Commercial, Lowerline to Millaudon; Mississippi, Lowerline to Millaudon; Ester, Lowerline to Gen. Scott; Ester, Cherokee, to Hillary; Burthe, Lowerline to Cherokee; Adams, Mississippi to Ann; Adams, St. Charles Avenue to Pearl; Mississippi, Adams to Burdette; Mississippi, Burdette to Fern.

ARC CIRCUIT No. 24. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne to Louisiana Avenue, to Magnolia and Oak, to Burdette, to Panola, to Carrollton, to Hampson, to Short, to Jeannette, to Fern, to Hampson, to Burdette, to Oak and Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOQPS: S. Carrollton Avenue, Panola to New Basin; Green, Burdette to Adams; Green, Burdette to Fern; Short, Hampson to St. Charles; Fern, Hampson to Commercial; Cohn, Burdette to Fern.

ARC CIRCUIT No. 25. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, thence underground to a point beyond the South bank of the New Basin Canal, where it will change to overhead and proceed as follows: S. Claiborne Street to Louisiana Avenue, to Magnolia and Oak, to Dublin, to Maple, to Cambronne, to Plum, to Gen. Ogden, to Jeannette, to Dublin, to Oak and Magnolia, to Louisiana Avenue, to S. Claiborne, to Power House.

LOOPS: Oak, Dublin to Dante; Dublin, Maple to St. Charles Avenue; Carrollton Avenue, St. Charles to River; Elm, Cambronne to Joliet; Elm, Cambronne to Dante; Monroe, Plum to River; River, Monroe to Mary; River, Monroe to Leonidas; Zimple, Monroe to Leonidas; Oak, Monroe to Joliet; Gen. Ogden, Plum to River; Poplar, Ogden to Protection Street; Gen. Ogden, Jeannette to Green; Birch, Gen. Ogden to Protection St.; Green, Holly Grove to Mary; Monroe, Birch to Poplar; Joliet, Jeannette to Poplar; Cambronne, Green to Poplar; Birch, Joliet to Dante; Dante, Jeannette to Poplar; Dublin, Jeannette to Green; St. Charles Avenue, Dublin to Carrollton.

ARC CIRCUIT No. 26. Fifty-two lamps, (52) commences at the Power House and runs underground on Cypress Street to S. Claiborne Street at which point it will change to overhead and proceed as follows: S. Claiborne to Lafayette, to Magnolia, to Poydras, to Liberty, to Perdido, to Magnolia, to Gravier, to S. Franklin, to Lafayette, to Saratoga, to Franklin, to Julia, to Liberty, to Lafayette, to S. Robertson, to Cypress, to Power House.

LOOPS: Magnolia, Cypress to Julia; Clara, Cypress to Julia; Derbigny, Cypress to Julia; Claiborne, Cypress to Julia; Freret, Cypress to Julia; Lafayette, Claiborne to Prieur; Poydras, Magnolia to Clara; seven lamps in Parish Prison; Cypress, Howard to S. Robertson.

ARC CIRCUIT No. 27. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to Freret Street, at which point it will change to overhead and proceed as follows: To Liberty, to Girod, to S. Basin, at which point it will change to underground and proceed as follows: Basin and Girod to Rampart, to Howard Avenue, to Dryades, to Julia, to Baronne, to Howard Avenue, to Tchoupitoulas, to S. Diamond, to S. Peters, to Howard Avenue, to Fulton, to St. Joseph, to Carondelet, to Julia, to S. Peters, to Girod, to Dryades, to Lafayette, to S. Basin, to Lafayette, to Liberty, to Cypress, to Power House.

LOOPS: S. Diamond, S. Peters to S. Front; Magazine, Girod to Notre Dame; one lamp St. Mary's Market; four lamps Lee Circle.

ARC CIRCUIT No. 28. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to Freret Street at which point it will change to overhead and proceed as follows: To Liberty, to Poydras, to S. Basin, at which point it will change to underground and proceed as follows: S. Basin and Poydras to Baronne, to Lafayette (through Lafayette Square), to Fulton, to Julia, to Water, to Notre Dame, to S. Front, to Poydras, to Carondelet, to Gravier, to Baronne, to Perdido, to S. Basin, to Power House.

LOOPS: Five lamps in City Hall; four lamps in Poydras Market; Girod, S. Front to Water; Lafayette, S. Front to Water; Poydras, S. Front to Water.

ARC CIRCUIT No. 29. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to Freret Street, at which point it will change to overhead and proceed as follows: To Liberty, to Poydras, to Basin, to Canal, South Side Neutral Ground to Claiborne, to Iberville, to Galvez, to Bienville, to Derbigny, to Iberville, to Claiborne, to North Side of Canal Street Neutral Ground, to Basin, to Poydras, to Liberty, to Cypress, to Power House. The only portion of this circuit underground is the Neutral Ground of Canal Street, Basin to Claiborne and Elk Place.

LOOPS: One lamp in Pilie Market.

ARC CIRCUIT No. 30. Forty-nine (49) lamps, commences at the Power House and runs underground on Cypress Street to Freret Street, at which point it will change to overhead and proceed as follows: To Liberty, to Common, to Basin, at which point it will change to underground and proceed as follows: Common and S. Basin to Rampart, to Gravier, to Dryades, to Common, to St. Charles, to Commercial Alley, to Camp, to Common, to Magazine, to Natchez, to Tchoupitoulas, to Gravier, to Delta, to Canal, South Side Canal Street Neutral Ground to S. Basin, through Elk Place to Common, to Power House.

LOOPS: Natchez, Magazine to Bank Alley; Tchoupitoulas, Canal to Common; Fulton, Canal to Common.

ARC CIRCUIT No. 31. Forty-nine (49) lamps. commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Galvez, to Cleveland, to Lopez, to Palmyra, to Miro, to Bank, to Broad, to Tulane, to Dorgenois, to Gravier, to Miro, to Perdido, to Rocheblave, to Poydras, to Galvez, to Cypress to Power House.

LOOPS: Roman, Cypress to Julia; Prieur, Cypress to Julia; Salcedo, Cleveland to Banks; Dupre, Cleveland to Banks; Galvez, Cypress to Julia; Miro, Banks to Tulane; Tonti, Banks to Tulane; Rocheblave, Banks to Tulane.

ARC CIRCUIT No. 32. Forty-eight (48) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Galvez, to Tulane, to Broad, to Gravier, to White, to Tulane, to Hagan Avenue; to Canal South Side Neutral Ground, Canal to Claiborne, to Cypress, to Power House.

LOOPS: Four lamps House of Detention; Gayoso, Tulane to Baudin. The only portion of this circuit underground is in the Neutral Ground of Canal Street, Hagan Avenue to Claiborne Street.

ARC CIRCUIT No. 33. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Galvez, to Tulane, to Hagan Avenue, to Canal, to South side Neutral Ground, to

Metairie Road, return on Neutral Ground, Canal Street to Anthony, to Cleveland Avenue, to N. Carrollton Avenue, Tulane Avenue to Galvez, to Cypress, to Power House. The only portion of this circuit underground is the Neutral Ground of Canal Street, Hagan Avenue to Metairie Road.

LOOPS: Hagan Avenue, Tulane to Perdido; Cleveland, Carrollton Avenue to Scott; Genois, Canal to Cleveland.

ARC CIRCUIT No. 34. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Customhouse, to Basin, at which point it will change to underground and proceed as follows: To Canal, and thence along the North Side of Canal Street Neutral Ground to Wells, to Customhouse, to N. Peters, to Bienville, to Decatur, to Customhouse, to Basin, to Power House.

LOOPS: Bienville, N. Peters to Wells.

ARC CIRCUIT No. 35. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Tulane, to Franklin, to Cleveland, to Galvez, to Customhouse, to Broad, to Bienville, to Miro, to Customhouse, to Galvez, to Cleveland, to Johnson, to Palmyra, to Derbigny, to Tulane Avenue, to Johnson, to Gravier, to Roman, to Perdido, to Claiborne, to Power House.

LOOPS: Perdido, Roman to Johnson; Gravier, Roman to

Derbigny; Broad, Bienville to Conti; Rocheblave, Bienville to Conti; Cleveland, Franklin to Basin; Howard, Tulane to Hospital Gate; Claiborne, Tulane to Palmyra; Perdido, S. Claiborne to Clara.

ARC CIRCUIT No. 36. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Bienville, to Franklin, to St. Louis, to Basin, to Carondelet Walk, to Galvez, to Orleans, to Broad, to St. Philip, to Johnson, to Carondelet Walk, to Basin, to St. Louis, to Franklin, to Bienville, to Claiborne, to Power House.

LOOPS: Galvez, Orleans to St. Ann; Tonti, St. Ann to Carondelet Walk; Dorgenois, St. Ann to St. Peter; Broad, St. Philip to Esplanade; Esplanade, Broad to Swamp; Swamp, Esplanade to Le Page; Orchid, Broad to Swamp; Rocheblave, Miro and Galvez, St. Philip to Dumaine.

ARC CIRCUIT No. 37. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Conti, to Franklin, to St. Louis, to Claiborne, to Toulouse, to St. Louis, to Hagan Avenue, to Bienville, to Cortez, to Iberville, to Gayoso, to Bienville, to White, to St. Louis and Toulouse, to Miro, to Conti, to Claiborne, to Power House.

LOOPS: Villere, St. Louis to Toulouse; Prieur, St. Louis to Toulouse; Galvez, St. Louis to Toulouse; Dupre, Conti to St.

Louis; Salcedo, Conti to St. Louis; Rendon, Conti to St. Louis; Tonti, St. Louis to Toulouse; Derbigny, Conti to St. Louis; Iberville, Cortez to Pierce; Lopez, Iberville to Bienville; Salcedo, Iberville to Bienville; White, Iberville to Bienville.

ARC CIRCUIT No. 38. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Bienville to Basin, at which point it will change to underground and proceed as follows: To Bienville, to Chartres, to Conti, to Clay, to St. Louis, to Exchange Alley, to Conti, to Burgundy, to St. Louis, to Royal, to Toulouse, to Decatur, to St. Peter, through Jackson Square, to St. Peter to Bourbon, to Toulouse, to Rampart, to Conti, to Basin, to Claiborne, to Power House.

LOOPS: Exchange Alley, Bienville to Court Buildings; Jackson Square, St. Ann and Decatur; Jackson Square, St. Ann and Chartres; St. Peter Street, two (2) lamps in Court Buildings.

ARC CIRCUIT No. 39. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Galvez, to Tulane, to Carrollton Avenue, to Metairie Road, to St. Patrick, to Orleans, to Alexander, to Iberville, to Carrollton Avenue, to Tulane, to Galvez, to Cypress, to Power House.

LOOPS: Twenty-five (25) lamps in City Park; St. Patrick, Orleans to Bienville; Murat, St. Peter to Orleans; Alex-

ander, Orleans to St. Ann; St. Louis, Alexander to David; Solomon, St. Louis to St. Peter; Solomon, Bienville to Iberville; Iberville, Alexander to Murat.

ARC CIRCUIT No. 40. Forty-eight (48) lamps, commences at Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Orleans, to Prieur, to Ursulines, to Dorgenois, to Bayou Road, to Rocheblave, to Esplanade, to Tonti, to Barracks, to Roman, to Hospital, to Derbigny, to Dumaine, to Claiborne, to Power House.

LOOPS: Derbigny, St. Peter to St. Ann; Roman, Orleans to St. Peter; Prieur, Orleans to St. Ann; Bayou Road, Dorgenois to Grand Route St. John; Broad, Bayou Road to Aubrey; Lapeyrouse, Broad to Swamp; Dupre, Lapeyrouse to D'Abadie; D'Abadie, Broad to White; D'Abadie, Dupre to Clay; Gentilly Road, D'Abadie to O'Reilly; Dumaine, Prieur to Roman; St. Philip, Prieur to Roman; Rocheblave, Barracks to Esplanade; Tonti, Barracks to Hospital; Galvez, Barracks to Hospital; Johnson, Barracks to Hospital.

ARC CIRCUIT No. 41. Forty-seven (47) lamps, commences at the Power House and runs underground on Cypress Street to Claiborne Street, at which point it will change to overhead and proceed as follows: To Orleans, to Dupre, to Esplanade, to Bayou St. John, to Ursulines, to Lopez, to St. Philip, to Hagan Avenue, to St. Ann, to Dupre, to Orleans, to Claiborne, to Power House.

LOOPS: Ursulines, White to Gayoso; Esplanade, Dupre to White; Dupre, Esplanade to Le Page; Lopez, Grand Route St. John to Maurepas; Dupre, Grand Route St. John to Maurepas; Florida, Dupre to White; Maurepas, Dupre to Lopez; Grand Route St. John, Hagan Avenue to Bayou St. John; one lamp in the Soldiers' Home; De Soto, Hagan Avenue to Bayou St. John; Bayou St. John, Ursulines to Bell; Gayoso, Esplanade to De Soto; De Soto, Gayoso to Lopez; Dumaine, Rendon to Moss; Gayoso, St. Ann to Dumaine; St. Ann, Dupre to White; White, Orleans to Toulouse; Toulouse, Hagan Avenue to Broad; Hagan Avenue, Toulouse to Carondelet Walk; Rendon, Orleans to St. Ann; Lopez, Bell to Ursulines.

ARC CIRCUIT No. 42. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Orleans, through Beauregard Square to Rampart Street, at which point it will change to underground and proceed as follows: Rampart and St. Peter to Dauphine, to St. Ann, to Royal, to Dumaine, to Chartres, to Madison, through the three French Markets, to Ursulines, to Chartres, to St. Philip, to Bourbon, to Dumaine, to Burgundy, to St. Ann, to Rampart, at which point it will change to overhead and proceed as follows: Through Beauregard Square, Orleans Street to Villere, to Dumaine, to Claiborne to Power House.

LOOPS: Villere, Orleans to St. Peter; Treme, Orleans to St. Ann.

ARC CIRCUIT No. 43. Fifty-one (51) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Ursulines, to Marais, to St. Philip, to Treme, to Dumaine, to St. Claude, at which point it will change to underground and proceed as follows: Dumaine to Rampart, to St. Philip, to Dauphine, to Ursulines, to Royal, to Hospital, to N. Peters, to Esplanade, to Decatur, to Barracks, to Bourbon, to Hospital, to Dauphine, to Barracks, to Bourbon, to Hospital, to Dauphine, to Barracks, to Rampart, to Ursulines, to St. Claude, at which point it will change to overhead and proceed as follows: To Barracks, to Marais, to Hospital, to Claiborne, to Power House.

LOOPS: Claiborne, Ursulines to St. Philip; Marais, St. Philip to Dumaine; St. Philip, Marais to Villere; Robertson, Hospital to Barracks.

ARC CIRCUIT No. 44. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Esplanade, to Chartres, to Frenchmen, to Decatur, to Elysian Fields, to Burgundy, to Touro. to Royal, to Kerlerec, to Claiborne, to Power House. Underground, Esplanade Avenue, Rampart to Chartres.

LOOPS: Four lamps Washington Square; Rampart, Kerlerec to Columbus; St. Claude, Kerlerec to Columbus.

ARC CIRCUIT No. 45. Fifty (50) lamps,, commences at the Power House and runs underground on Cypress Street to

S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Esplanade, to Miro, to Columbus, to Dorgenois, to D'Abadie, to Rocheblave, to Lapeyrouse, to Tonti, to St. Bernard, to Roman, to Lapeyrouse, to Galvez, to Columbus, to Claiborne, to Power House.

LOOPS: Tonti, Columbus to Kerlerec; Columbus, Dorgenois to Rousselin; Lapeyrouse, Dorgenois to Rousselin; D'Abadie, Dorgenois to Rousselin; Miro, St. Bernard to D'Abadie; Galvez, St. Bernard to Onzaga; N. Johnson, St. Bernard to New Orleans; London Avenue, N. Johnson to Grant; Celestine, St. Bernard to New Orleans; Josephine, St. Bernard to London Avenue; N. Derbigny, St. Bernard to New Orleans; Lapeyrouse, Galvez to Miro; Laharpe, Tonti to Galvez; Prieur, Kerlerec to Laharpe; Derbigny, Kerlerec to Laharpe; Galvez, Columbus to Kerlerec.

ARC CIRCUIT No. 46. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Annette, to Johnson, to Frenchmen, to Roman, to Touro, to Grant, to St. Anthony, to Urquhart, to Bourbon, to Rampart, to St. Anthony, to St. Claude, to St. Bernard Avenue, to Claiborne, to Power House.

LOOPS: Josephine, Annette to Allen; Grant, Annette to Allen; Frenchmen, Johnson to Law; Force, Frenchmen to Touro; Celestine, St. Anthony to Bourbon; Derbigny, St. Anthony to Bourbon; Claiborne, St. Anthony to Bourbon; Robertson, Annette to Bourbon; Marais, Bourbon to St. Anthony; Claiborne, Allen to Laharpe; Bourbon, Rampart to Burgundy;

Urquhart, Annette to St. Bernard; Villere, St. Bernard to Columbus; Robertson, St. Bernard to Laharpe.

ARC CIRCUIT NO. 47. Forty-nine (49) lamps, commences at the Power House and then runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Frenchmen, to Derbigny, to Elysian Fields, to Marigny, to Frenchmen, to Milneburg, to Frenchmen, to Marigny, to Elysian Fields, to Derbigny, to Music, to Claiborne, to Lafayette Avenue, to Robertson, to St. Roch, to Claiborne, to Frenchmen, to St. Claude, to Touro, to Claiborne, to Power House.

LOOPS: Josephine, Elysian Fields to Marigny; Mandeville, Derbigny to Roman; St. Roch, Derbigny to Roman; Touro, St. Claude to Rampart; Johnson, Elysian Fields to Mandeville.

ARC CIRCUIT NO. 48. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Elysian Fields, to Rampart, to Marigny, to N. Peters, to Lafayette Avenue, to Chartres, to Spain, to Decatur, to Mandeville, to St. Claude, to Marigny, to Urquhart, to Spain, to Royal, to St. Roch, to Urquhart, to Lafayette Avenue, to Villere, to Marigny, to Claiborne, to Power House.

LOOPS: Mandeville, St. Claude to Marais; Rampart, St. Roch to Music; St. Claude, St. Roch to Music; Lafayette Avenue, Urquhart to Marais; Spain, Villere to Robertson.

ARC CIRCUIT No. 49. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Port, to St. Claude, to Lafayette Avenue, to Burgundy, to Port, to Dauphine, to Lafayette Avenue, to Royal, to Port, to Decatur, to St. Ferdinand, to Chartres, to Louisa, to Urquhart, to Clouet, to Dauphine, to Montegut, to Villere, to Press, to Dauphine, to St. Ferdinand, to Claiborne, to Power House.

LOOPS: Port, Decatur to N. Peters; Press, Chartres to N. Peters; Louisa, Urquhart to Claiborne; Clouet, Dauphine to Royal; Press, Royal to Dauphine; St. Ferdinand, Royal to Dauphine; Marais, Montegut to Feliciana; Villere, Montegut to Feliciana.

ARC CIRCUIT NO. 50. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Port, to Urquhart, to Piety, to St. Claude, to Poland, to Burgundy, to Japonica, to Dauphine, to Poland, to Chartres, to Piety, to Royal, to Mazant, to Dauphine, to Desire, to Burgundy, to Bartholomew, to Rampart, to Piety, to Urquhart, to Port, to Claiborne, to Power House.

LOOPS: Independence, St. Claude to Marais; Alvar, St. Claude to Marais; Mazant, St. Claude to Marais; Lesseps, St. Claude to Marais; Rampart, Lesseps to Kentucky; Royal, Poland to Lesseps; Burgundy, Bartholomew to Mazant; Dauphine, Mazant to France; Burgundy, Desire to Piety; and two lamps in Macarty Square.

ARC CIRCUIT No. 51. Fifty (50) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed as follows: To Port, to St. Claude, to Poland, to Dauphine, to Jourdan Avenue, to Royal, to Lizardi, to Dauphine, to Andry, to N. Peters, to Flood, to Dauphine, to Charbonnet, to Royal, to Tricou, to N. Peters, to Delery, to Dauphine, to Tricou, to Burgundy, to Convent, to Dauphine, to Poland, to St. Claude, to Port, to Claiborne, to Power House.

LOOPS: Jourdan Avenue, Royal to N. Peters; Royal, Jourdan Avenue to Sister; Reynes, Royal to Dauphine; Royal, Flood to Caffin; Chartres, Tricou to Hancock; N. Peters, Tricou to Jourdan; Hancock, Dauphine to Rampart; Gordon, Dauphine to Burgundy; Jourdan Avenue, Burgundy to Rampart.

ARC CIRCUIT NO. 52. Forty-five (45) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed along S. Claiborne Street, North Claiborne Street and St. Louis Street to N. Basin Street, at which point it will follow St. Louis underground to the bank of the Mississippi River, and thence by cable to the West bank of the River, at which point it will change to overhead and proceed as follows: Patterson, at intersection of Seguin Street down to Lower Coast, to Lawton's Lane, and return Patterson Street to Atlantic Avenue, to Pelican Avenue, to Pacific Avenue, to Eliza, to Atlantic, to Homer, to Pacific Avenue, to Slidell, to Elmira Avenue, to Pelican Avenue, to Verret, to Lavergne, to Delaronde, to Bermuda, to Patterson, to Seguin, to Power House.

LOOPS: One lamp St. John Market; Olivier, Patterson to Thayer; Pacific, Patterson to Thayer; Whitney Avenue, Patterson to Alix; Opelousas Avenue, Elmira to Pacific.

ARC CIRCUIT NO. 53. Forty-four (44) lamps, commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and proceed along S. Claiborne Street, N. Claiborne Street, and St. Louis Street to N. Basin Street, at which point it will follow St. Louis Street underground to the bank of the Mississippi River and thence by cable to the West bank of the River, at which point it will change to overhead and proceed as follows: Patterson, at the intersection of Seguin, to Pelican Avenue, to Bermuda, to Alix, to Belleville, to Homer, to Verret, to DeArmas, to Teche, to Slidell, to Vallette, to Eliza, to Verret, to Opelousas, to River Street, to Eliza, to Seguin, to Alix, to Bouny, to Morgan, to Seguin, to Patterson, to Power House.

LOOPS: Diana, Nunez to Brooklyn; Homer, Teche to Brooklyn; Opelousas, Verret to Olivier; Alix, Bouny to Powder; Pelican Avenue, Bouny to Powder.

INCANDESCENT CIRCUIT NO. 1. Commences at the Power House and runs underground on Cypress Street to Freret Street, at which point it will change to overhead and proceed as follows: To Liberty, to Lafayette, to Basin, at which point it will change to underground and proceed as follows: Basin to Lafayette, Lafayette, through Lafayette Square to Camp Street, and return over the same route to Power House.

INCANDESCENT CIRCUIT NO. 2. Commences at the Power House and runs underground on Cypress Street to S. Claiborne Street, at which point it will change to overhead and extend along S. Claiborne and N. Claiborne Street to St. Peter Street, thence to Rampart Street, at which point it will change to underground, and thence through St. Peter Street to Chartres Street, from which point it will return by the same route to the Power House.

182. INCANDESCENT LIGHTING. (a) The City Hall, the New Court House and Jail Building, and the several Court Buildings in the vicinity of Jackson Square, shall be entirely rewired, and connected to street system.

(b) The wiring shall be installed in accordance with the best practices of the day. Everything necessary to the completion of the system, which may not be specifically mentioned in the following paragraphs shall be furnished.

(c) High grade wires with heavy rubber and braided insulation shall be used.

(d) The wires shall have ample carrying capacity, and the drop of pressure, when all lights are burning, shall not exceed two (2) volts from street service cut-out to farthest limit.

(e) No more than twelve (12) lights shall be connected to one branch circuit; all outlets shall be protected by individual fuse cut-outs.

The branch cut-outs shall be placed in Cabinets, located so as to make the cut-outs readily accessible.

(f) Street connections, except at the New Court House and

Jail Building, shall enter the buildings through proper underground tubes at the most suitable location.

(g) No fixtures are required to be furnished by the contractor; all existing fixtures shall be rewired and put in good order.

All lights that are not to be on electrolier fixtures shall be ordinary flexible cord pendants, which shall be entirely renewed.

(h) Each installation, when completed and connected up, shall show an insulation resistance of not less than one megohm.

Each branch from Cabinet shall show not less than five (5) megohms.

(i) The street conduits and conductors for the incandescent lighting will be paid for at the price bid, in the proposal, for those items. The price bid, in the proposal, for incandescent lighting, will include all materials and labor necessary to comply with the preceding paragraphs of this section of these specifications.

NEW ORLEANS, LA., Jan. 20th, 1902.

Respectfully submitted to the Special Committee of the City Council for consideration and approval.

(Signed) W. J. HARDEE,
City Engineer.

(Signed) FOSTER OLROYD,
City Electrician.

(Signed) ALFRED RAYMOND,
Manager of Drainage.

Adopted by the City Council of the City of New Orleans, February 4th, 1902.

(Signed) T. W. CAMPBELL,
Clerk of Council.

Approved February 7th, 1902.

(Signed) PAUL CAPDEVIELLE,
Mayor.

A true Copy:

C. H. LAVILLEBEUVRE,
Secretary to the Mayor.

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